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GREAT LAKES FORESTRY CENTRE
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A review of important forest insect and disease problems in the TIMMINS DISTRICT of Ontario, 1950-1980

Compiled by

H. J. Weir, M. J. Thomson,
D. C. Constable and C. G. Jones

Miscellaneous Report No. 59

Canada

A REVIEW OF IMPORTANT FOREST INSECT AND DISEASE PROBLEMS IN THE TIMMINS DISTRICT OF ONTARIO, 1950-1980

Compiled by

H.J. Weir, M.J. Thomson, D.C. Constable and C.G. Jones[1]

GREAT LAKES FORESTRY CENTRE

CANADIAN FORESTRY SERVICE

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1950-1953	D.F. Lynn
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1979	L.S. MacLeod, H.J. Evans and W.A. Ingram
1980	L.S. MacLeod, D.C. Constable and W.A. Ingram

FOREWORD

The first forest insect surveys in Ontario were carried out in 1936 from the Dominion Entomological Laboratory in Ottawa and continued from this location until 1944, when the province of Ontario was divided, for the purpose of these surveys, into northern and southern Ontario. In 1945, personnel from Ottawa continued to conduct and report on surveys in the area south of the Algonquin Park and Parry Sound forest districts, while personnel from the Forest Insect Laboratory in Sault Ste. Marie carried out surveys in the area to the north. In 1950 responsibility for reporting insects for all of Ontario fell to the Sault Ste. Marie laboratory. In 1952 the Forest Disease Survey was initiated with headquarters in Maple, Ontario; it was moved to Sault Ste. Marie in 1967. The results of these surveys of insects and diseases are reported in the Annual Report of the Forest Insect and Disease Survey (FIDS) published by Canadian Forestry Service headquarters in Ottawa. In addition, annual district and regional reports, begun in 1948, are prepared by FIDS technicians (Rangers) in Sault Ste. Marie. In 1980 a new provincial report was released in Ontario. The contents of the following review have been abstracted from these reports and compiled in alphabetical order by the scientific names of species in each of the following categories:

Major Insects or Diseases

Capable of causing serious injury to or death of living trees or shrubs.

Minor Insects or Diseases

Capable of causing sporadic or localized injury but not usually a serious threat to living trees or shrubs.

Abiotic Damage

Damage caused by non-living factors.

Diebacks and Declines

Damage usually characterized by the death or deterioration of tree crowns and caused by either biotic or abiotic factors, frequently unknown.

All measurements in this review are in metric form and conversions from Imperial measurements given in the earliest reports are taken to the second decimal point [i.e., sq. mi. to km^2 = area (sq. mi.) x 2.59 = area km^2]. Infestation maps in this review were copied from the original maps in the FIDS technicians' reports. Abbreviations for the common names of the host tree species as well as the full scientific names, are given in Appendices A and B. To facilitate the location of hosts, deciduous and coniferous species have been separated and listed alphabetically under the common names.

Appendix C is a series of maps for northeastern Ontario grouped alphabetically by insect species or disease pathogen and showing the location of infestations within a region or infestation boundaries that extend beyond regions.

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INTRODUCTION

This report is a review of significant forest insects and diseases that have occurred in the Timmins District throughout the period 1950 to 1980, with a brief summary of outbreaks prior to 1950. In the selection of pests for this report particular attention was paid to the major working groups of host species in the district, namely hardwoods (red maple, poplar and birch) and conifers (tamarack, white pine, red pine, jack pine, spruce and balsam fir), as well as some ornamental and shade trees. The insects included are capable of causing, or have caused, tree mortality or a reduction in growth. Abiotic problems that cause tree damage, e.g., frost, hail, snow, and wind, are discussed as well.

SUMMARY

FOREST INSECTS

Birch Sawfly, *Arge pectoralis* (Leach) [Major]
page 11

Defoliation by this sawfly is generally confined to open-grown fringe or ornamental trees and rarely causes outright tree mortality; however, repeated defoliation over a period of years predisposes the trees to attack by other insects or diseases. Varying degrees of defoliation were evident in the district most years from 1954 until 1965.

Birch Skeletonizer, *Bucculatrix canadensisella* Cham. [Major]
pages 12-16

Defoliation by this insect seldom causes mortality of the host but the weakened trees are subject to attack by secondary insects and diseases. Large outbreaks usually last 3 to 4 years, then decline rapidly. Outbreaks since the Insect Survey was begun in 1936 were recorded from 1941 to 1944, from 1953 to 1954, from 1962 to 1965, and from 1971 to 1973.

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.) [Major]
pages 17-22

When viewed from the air, defoliation by this insect is very similar to that caused by forest tent caterpillar. Although severe defoliation occasionally occurs there is no evidence of tree mortality; however, the affected trees do suffer a loss of growth increment and are weakened; consequently, they are predisposed to attack by insects or diseases. Small pockets of heavy infestation discovered in 1958 marked the first record of this insect in the district. Heavy infestations also occurred from 1970 to 1974.

Spruce Budworm, *Choristoneura fumiferana* (Clem.) [Major]
pages 23-42

This insect is considered the most destructive insect pest of several coniferous hosts in eastern Canada, the main hosts being white spruce and balsam fir. Though not major hosts, black spruce, eastern hemlock and tamarack are attacked and considerable tree mortality can occur. This report deals mainly with infestations recorded from 1950 to 1980. An infestation first recorded in 1940 persisted until 1950. During this period considerable tree mortality occurred. The most recent infestation persisted from 1962, when small numbers were found, to 1967; then a marked increase occurred, and heavy damage was recorded each year until 1980. Considerable tree mortality and top killing were evident each year from 1977 to 1980.

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr. [Major]
page 43

This insect is more commonly found on lateral shoots when populations are low; however, when high populations occur, terminal shoots are often killed; subsequently there is a loss of tree height and stems are deformed. Light damage found in 1977 marked the first record of the insect in the district. Relatively high populations were evident at scattered points from 1979 to 1980, and caused considerable leader mortality.

Birch Leafminer, *Fenusa pusilla* (Lep.) [Major]
pages 43-44

Damage by this insect is usually restricted to individual shade or ornamental trees, but infestations occasionally build up in stands of birch. Prolonged defoliation can weaken trees, which are then predisposed to diseases and borer attacks. The first damage caused in the district by this leafminer was recorded in 1965. Severe foliar damage was recorded in 1966 and 1967, and from 1975 to 1980.

American Aspen Beetle, *Gonioctena americana* (Schaef.) [Major]
pages 44-45

Although this insect is not known to cause serious damage, repeated defoliation weakens host trees, predisposing them to attack by other insects and diseases. Small pockets of varying degrees of infestation were observed frequently after 1952.

Pine Engraver, *Ips pini* (Say) [Major]
page 46

This beetle is capable of causing serious damage in weakened stands and in thinned-out plantations if slash material is left avail-

able as a breeding site. Populations build up rapidly before attacking healthy, living trees. High populations occurred at one point in the district in 1961 and 1962.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. [Major]
pages 46-54

Infestations causing varying degrees of defoliation have been recorded periodically since 1941 when small areas of defoliation occurred. A new infestation started to build up in 1943 and persisted until 1945. In 1950, pockets of light infestation were found. These increased in area and intensity until 1955, when populations decreased to light intensity. In 1957 a complete collapse occurred. Although no major infestations have materialized in the past several years, small pockets or areas of damage were recorded in 1964, 1972, 1973 and 1978. Prolonged defoliation can seriously reduce growth increment and weaken stands, leaving them predisposed to attack by diseases and boring insects.

Whitespotted Sawyer, *Monochamus scutellatus* (Say) [Major]
page 55

Although the white spotted sawyer beetle is one of the most common and widely distributed borer species in North America, damage seldom occurs except on decadent trees. However, in latter years populations have increased, and in 1980 severe damage was caused by adults feeding on branches and twigs of trees adjacent to log dumps.

Balsam Fir Sawfly, *Neodiprion abietis* complex [Major]
page 55

Mortality of balsam fir and white spruce trees can occur when severe defoliation persists over a number of years. Surveys through the period 1950-1980 did not reveal any heavy infestations or serious damage caused by this insect.

Pine Sawflies, *Neodiprion nanulus nanulus* Schedl. [Major]
and *N. pratti banksianae* Roh.
pages 56-57

These sawflies are capable of causing severe damage to, and in some instances mortality of, semimature and plantation trees when populations persist at a high level over a period of years. Surveys through the period 1950-1980 have occasionally revealed small pockets of light infestation; however, damage was negligible in each instance.

Redheaded Jack Pine Sawfly, *Neodiprion virginianus* complex [Major]
pages 57-58

This sawfly is capable of causing mortality of semimature jack pine and jack pine plantation trees when high populations persist over a few years; however, there is no evidence of mortality in the district, even though pockets of severe defoliation were recorded several times from 1954 and 1977.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.) [Major]
pages 59-60

Although there are no records of this insect causing tree mortality, heavy infestations persisting over a few years cause a loss of growth increment. Populations occasionally mine 100% of the leaves, especially in reproduction areas. High populations were recorded in the district in 1951, 1962, 1963 1965, and 1966, and from 1975 to 1977.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.) [Major]
pages 60-62

This sawfly is a serious pest of open-grown trees, ornamentals, and stands or plantations of young white spruce trees. Although no large areas of tree mortality have ever been recorded in the district, severe defoliation and single-tree mortality have been recorded periodically since 1946.

White Pine Weevil, *Pissodes strobi* (Peck) [Major]
pages 62-63

This pest of pines and spruces causes a serious reduction in height growth, crooked stems and eventually severe distortion if the tree is subjected to repeated attack. It is the most serious insect pest of white pine in North America. Varying levels of damage have occurred most years since 1956, when the insect was first recorded in the district.

Larch Sawfly, *Pristiphora erichsonii* (Htg.) [Major]
pages 64-65

Degrees of larch sawfly infestation have been reported in the district periodically since 1938. Severe defoliation by the insect over 4 to 5 years causes a loss in increment, and after 6 to 9 years there is some tree mortality. High populations were recorded from 1955 to 1959 and from 1968 to 1970.

FOREST DISEASES

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer [Major]
page 85

This fungus is known to cause mortality in all tree species regardless of age or condition. Damage and/or mortality were recorded periodically in the district from 1963 to 1978.

Scleroderris Canker, *Ascocalyx abietina* (Lagerb.)
Schläpfer-Bernhard [Major]
pages 86-88

This pathogen can cause serious problems and considerable mortality in young natural regeneration and in plantations. The first incidence of the disease in the district was recorded in 1966 and subsequent annual surveys have revealed damage at several locations.

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary
and *C. ledicola* (Peck) Lagerh. [Major]
page 89

These foliar rusts are not usually a serious problem but in epidemics they can cause premature defoliation and significant growth loss in the year after attack. Varying levels of infection were reported periodically in the district from 1955 to 1980.

Ink Spot of Aspen, *Ciborinia whetzelii* (Seaver) Seaver [Major]
page 90

Severe defoliation by this foliar disease results in a loss of increment. No record of tree mortality caused by the disease has been reported. Varying levels of damage occurred in the district from 1959 to 1980.

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur [Major]
page 91

This pathogen is capable of causing significant damage in stands in all age classes. In immature stands considerable mortality can occur and in mature stands significant loss of merchantable wood has been recorded. Varying degrees of damage occurred periodically in the district from 1955 to 1979.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.) [Major]
pages 65-66

Although mountain-ash is not classified as a merchantable species, large numbers are utilized as ornamentals in towns and urban areas. Prolonged severe defoliation weakens trees, leaving them predisposed to attack by other insects such as woodborers. Varying degrees of infestation have been evident most years since 1962, when the insect was first recorded in the district.

Ambermarked Birch Leafminer, *Profenusa thomsoni* (Konow) [Major]
pages 66-67

High populations of this leafminer cause serious foliar damage; however, as it feeds late in the growing season, weakening trees and predisposing them to attack by other insects, there are no records of the insect causing tree mortality. The insect was first recorded in the district in 1955. Heavy infestations occurred from 1957 to 1963 and in 1968.

Aspen Leafroller, *Pseudexentera oregonana* Wlshm. [Major]
pages 68-71

Although this insect is capable of causing severe defoliation of host trees, heavy infestations generally persist only 1 to 2 years; consequently, apart from the fact that it causes a reduction in growth increment during periods of heavy infestation, little damage has been noted. The insect was first recorded in the district in 1965 and heavy infestations occurred in 1976 and 1977.

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.) [Major]
page 72

Feeding by large populations of this scale insect results in considerable branch mortality or the death of affected trees in reproduction areas and in plantations. Heavy damage was recorded at one point from 1965 to 1967 and in 1969.

Other Noteworthy Insects [Major and Minor]
pages 73-81

Insects with the potential for causing damage to stands, regeneration and plantations.

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer [Major]
page 92

Blister rust kills white pine of all ages, with the smaller trees dying more rapidly. The disease was first recorded in the district in 1962 and varying levels of infection occurred most years through to 1971, when it was last reported.

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats. [Major]
pages 92-93

Galls on the main stem can kill young trees or cause deformation and conspicuous branch mortality on older trees. The disease was first recorded in the district in 1969 and varying levels of infection were noted at scattered points most years through to 1980.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller [Major]
pages 93-94

This disease is a serious problem of aspen, often resulting in wind breakage or the death of the part of the tree distal to the canker. Incidence varies widely depending on tree size and stand site. Varying levels of infection have been observed most years since the disease was first recorded in the district in 1953.

Shoot Blight, *Venturia macularis* (Fr.) Müller & v. Arx [Major]
pages 94-95

High infection levels of this disease result in serious damage in aspen reproduction stands, particularly when leaders are attacked. Repeated attack deforms the trees and causes extensive loss in height growth. Varying degrees of damage have been reported at several locations since the disease was first recorded in the district in 1960.

Other Noteworthy Diseases
pages 95-96

These are diseases with the potential for causing damage to stands, plantations and regeneration.

ABIOTIC DAMAGE

pages 99-100

This damage, caused by abnormal weather conditions such as wind, hail and frost, can cause tree mortality or leave affected trees in a weakened condition, thus subjecting them to attack by secondary insects or disease. There is no record of damage prior to 1963.

INSECTS

Birch Sawfly, *Arge pectoralis* (Leach)

Host(s): birch [Major]

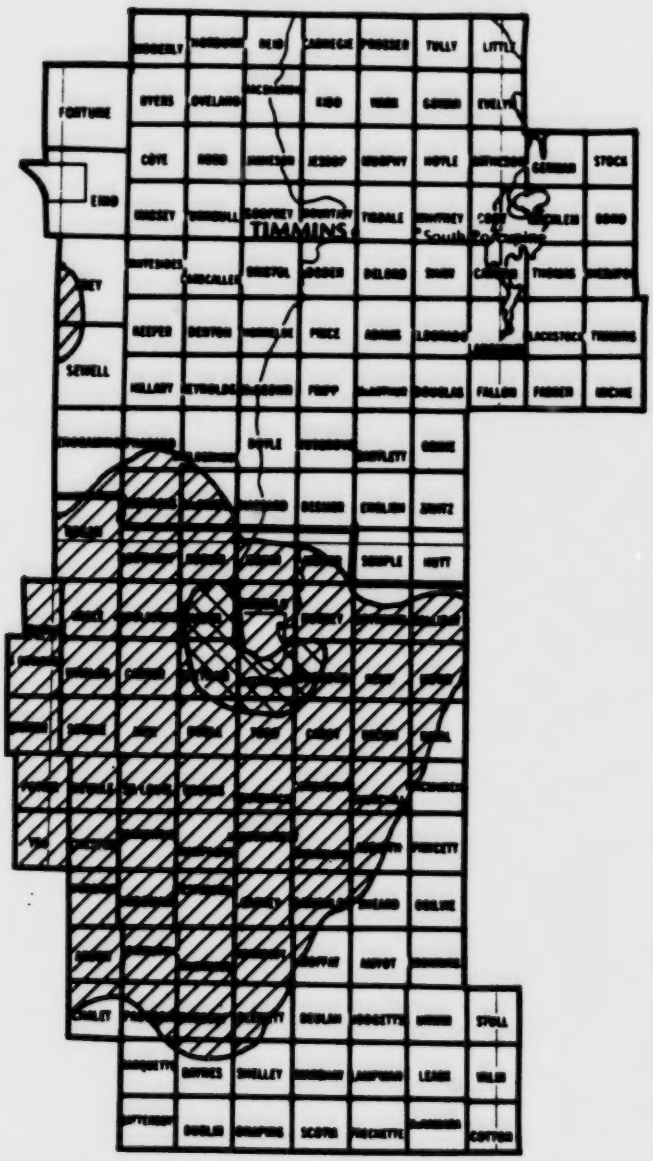
Year	Remarks
1950-1953	not reported
1954	Light-to-moderate defoliation was evident on open-grown white birch trees in German, Evelyn and Mountjoy twps.
1955	A heavy infestation occurred in Timmins and Adams twps, and light-to-moderate damage was evident at other points. Defoliation ranged from 5% to 75% on open-grown trees.
1956	A heavy infestation caused 60% defoliation at one point in Sheraton Twp. Light-to-moderate defoliation was evident in Mountjoy, Adams and German twps. Scattered colonies were commonly observed elsewhere.
1957	Light-to-medium infestations caused approximately 20% defoliation in German Twp. Appreciable declines in population levels were evident in the remainder of the district.
1958	Light damage was recorded in Sheraton and German twps. At other points examined only trace numbers could be found.
1959	Light damage recurred in German and Sheraton twps; little change in numbers was evident in the remainder of the district.
1960	Populations declined to a trace level.
1961-1962	not reported
1963-1965	small numbers observed at scattered points
1966-1980	not reported

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Host(s): birch [Major]

Year	Remarks
1950-1952	not reported
1953-1954	Moderate-to-severe defoliation was encountered in birch stands throughout the district.
1955	Infestations virtually disappeared; only trace defoliation could be found.
1956-1961	not reported
1962	Light-to-medium infestations occurred in the southern half of the district.
1963	Infestations increased in area and intensity and caused light defoliation in the southwestern part of the district (see map, page 13).
1964	Heavy infestations occurred in the northeastern part and light infestations were general throughout the remainder of the district (see map, page 14).
1965	A sharp decline in populations occurred.
1966	Only trace populations could be found.
1967-1969	not reported
1970-1971	Trace populations were observed.
1972	A marked increase in populations caused moderate-to-severe defoliation in the northeastern part of the district (see map, page 15).
1973	Populations decreased markedly, leaving a light infestation in the eastern part of the district (see map, page 16).
1974	Populations collapsed; no damage occurred.
1975-1980	not reported

TIMMINS AND GOGAMA DISTRICTS



BIRCH SKELETONIZER

Areas within which defoliation occurred in 1963

LEGEND

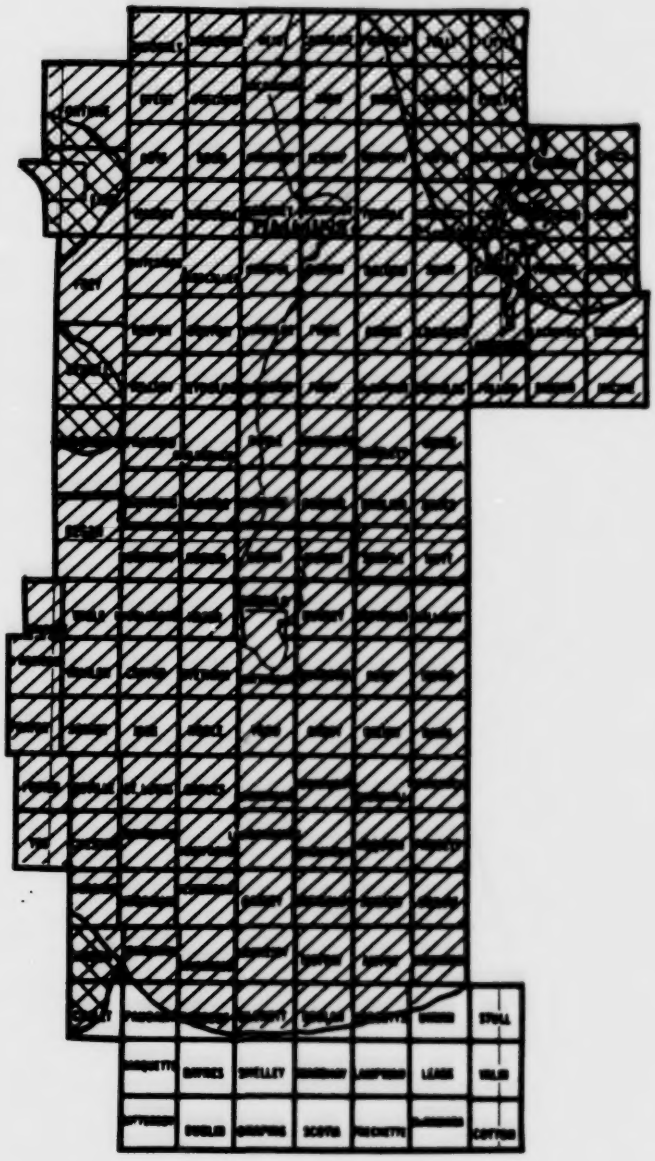
Light defoliation

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



BIRCH SKELETONIZER

Areas within which defoliation occurred in 1964

LEGEND

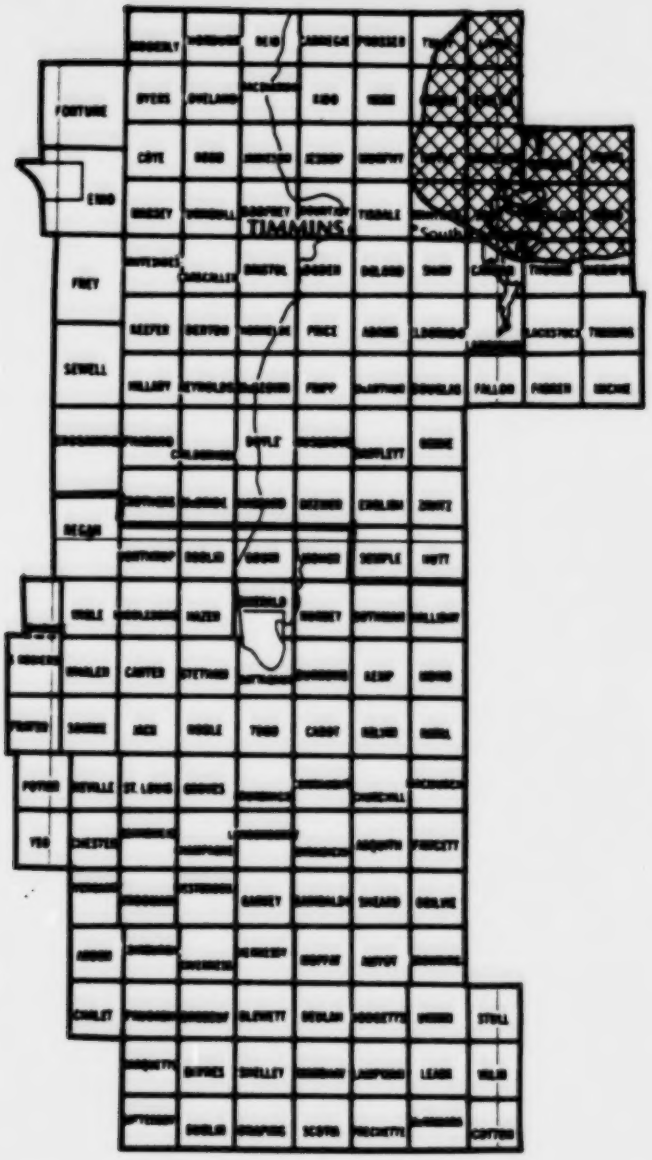
Light defoliation

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



BIRCH SKELETONIZER

Areas within which defoliation occurred in 1972

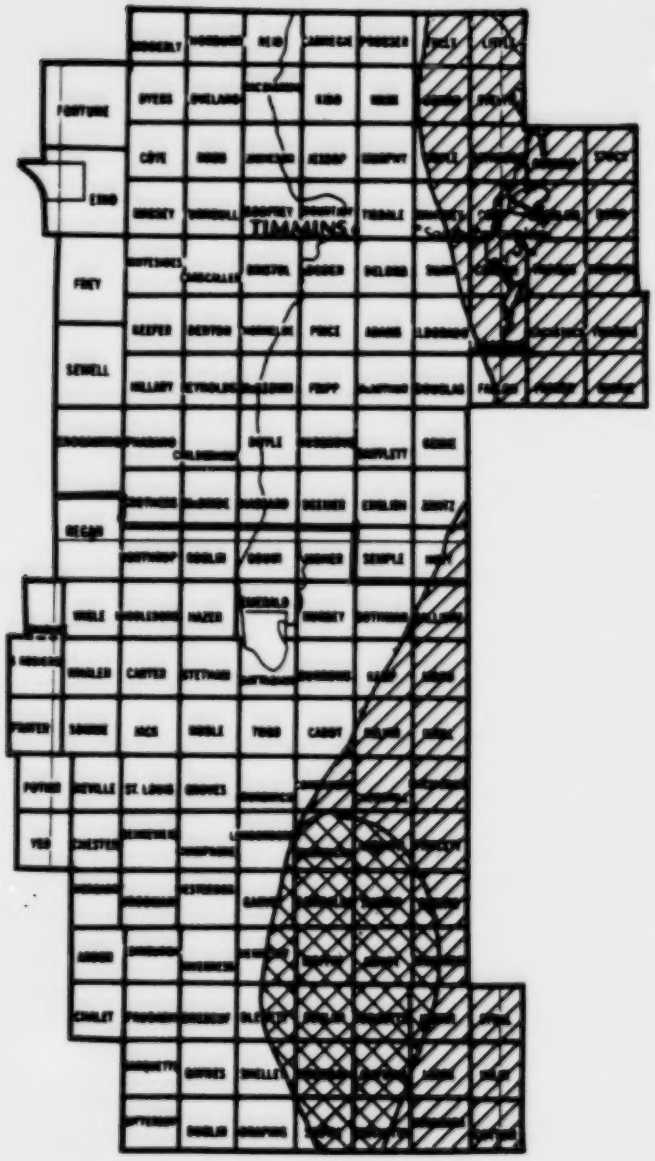
0 KM 40

SCALE

LEGEND

Moderate-to-severe defoliation

TIMMINS AND GOGAMA DISTRICTS



BIRCH SKELETONIZER

Areas within which defoliation occurred in 1973

LEGEND

Light defoliation

Moderate-to-severe defoliation

0 KM 40

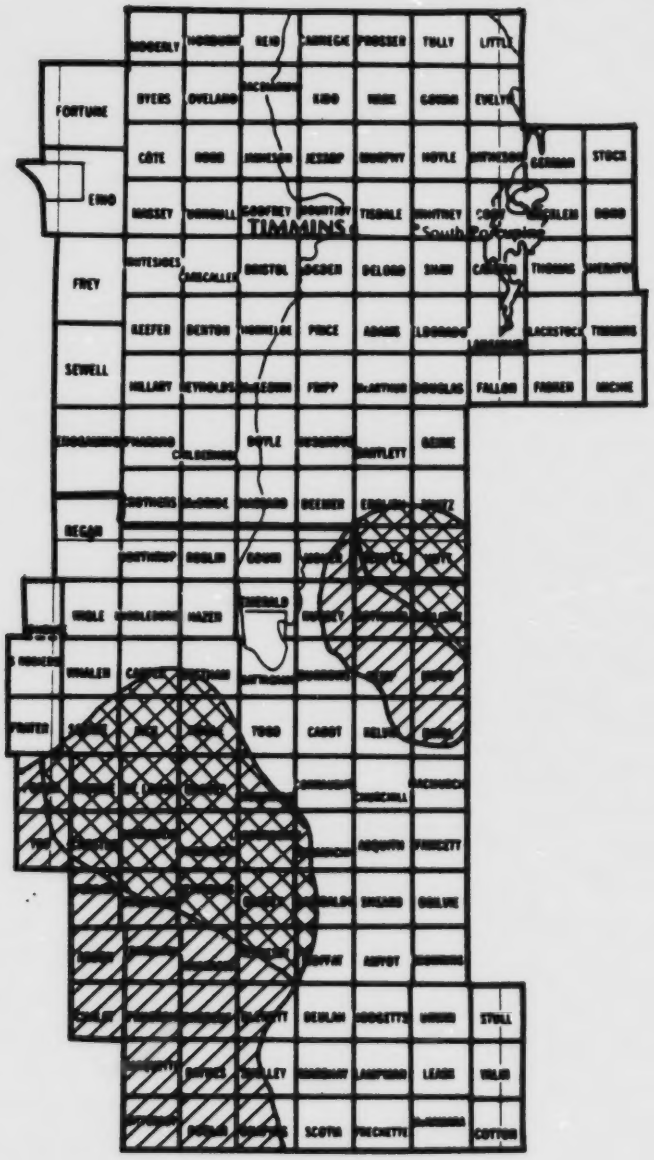
SCALE

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.)

Host(s): poplar [Major]

Year	Remarks
1950-1957	not reported
1958	Pockets of heavy infestation were discovered at four points in the southern part of the district (see map, page 18).
1959	Infestations collapsed; no damage could be found.
1960-1968	not reported
1969	Small numbers of larvae were observed at numerous points in the district.
1970	A heavy infestation occurred on approximately 375 km^2 of forested land in the southeastern part of the district.
1971	Small, heavy infestations were recorded at five points in the district (see map, page 19).
1972	Populations increased and caused moderate-to-severe defoliation in most stands throughout the district (see map, page 20).
1973	Heavy infestation persisted; however, the area infested decreased to about half of that reported the previous year (see map, page 21).
1974	Heavy infestations persisted in the northeastern part of the district (see map, page 22).
1975	Populations declined to a low level.
1976-1977	Trace populations were observed at a small number of points.
1978-1980	not reported

TIMMINS AND GOGAMA DISTRICTS



LARGE ASPEN TORTRIX

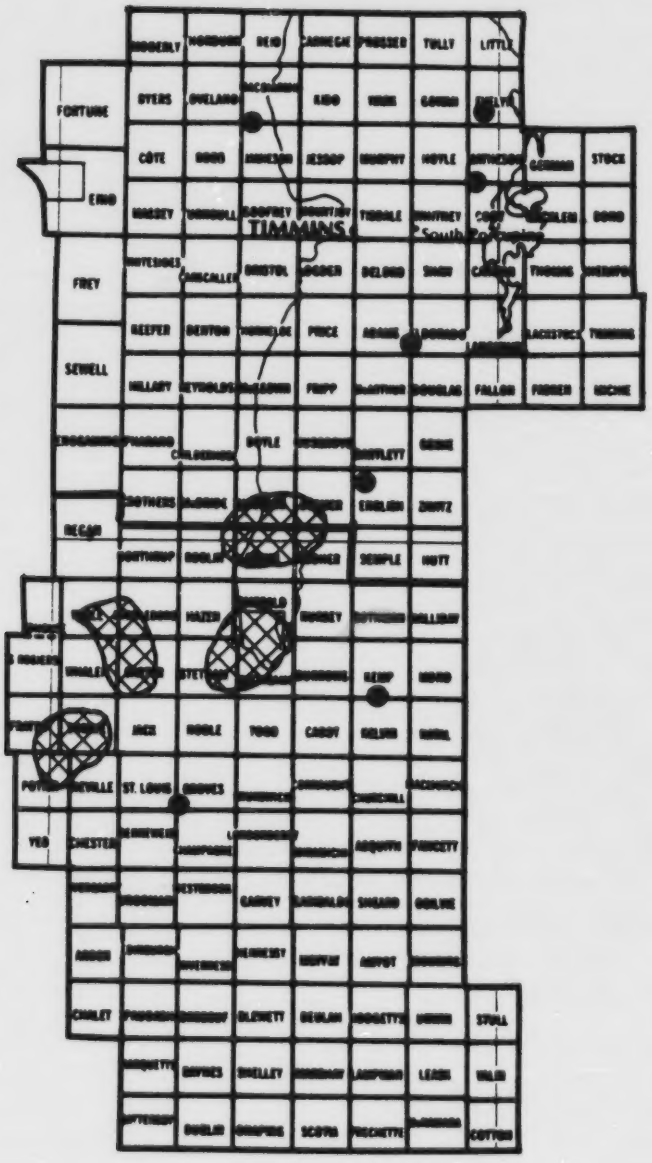
Areas within which defoliation occurred in 1958

LEGEND

Light defoliation

Moderate-to-severe defoliation

TIMMINS AND GOGAMA DISTRICTS



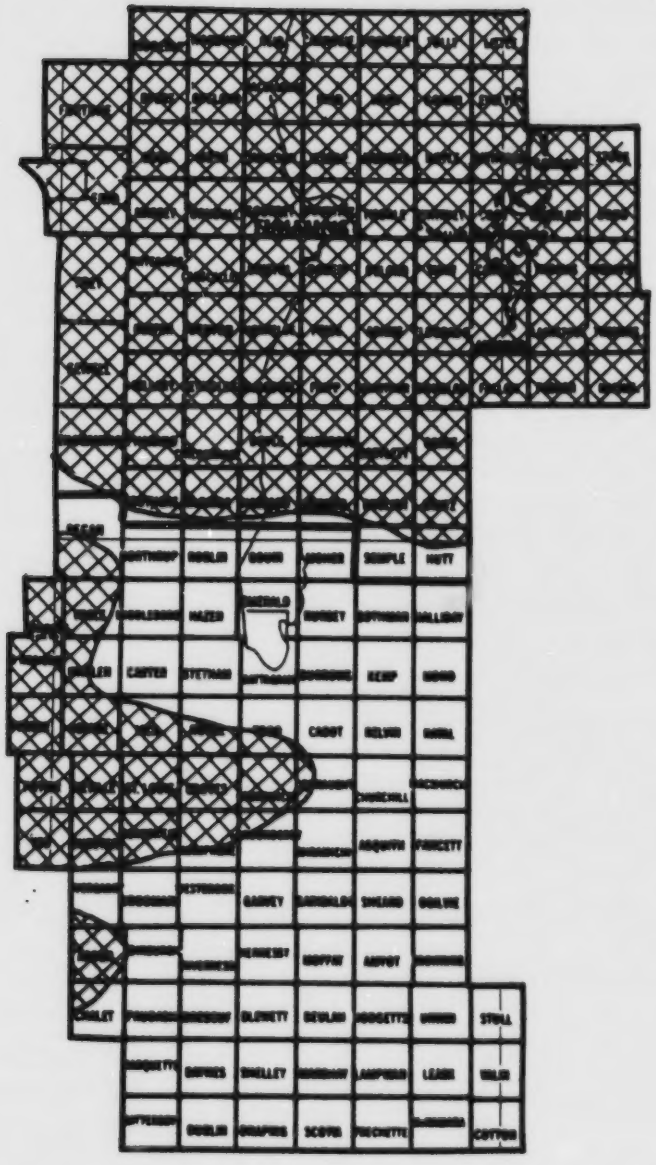
LARGE ASPEN TORTRIX

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation ● or

TIMMINS AND GOGAMA DISTRICTS



LARGE ASPEN TORTRIX

Areas within which defoliation occurred in 1972

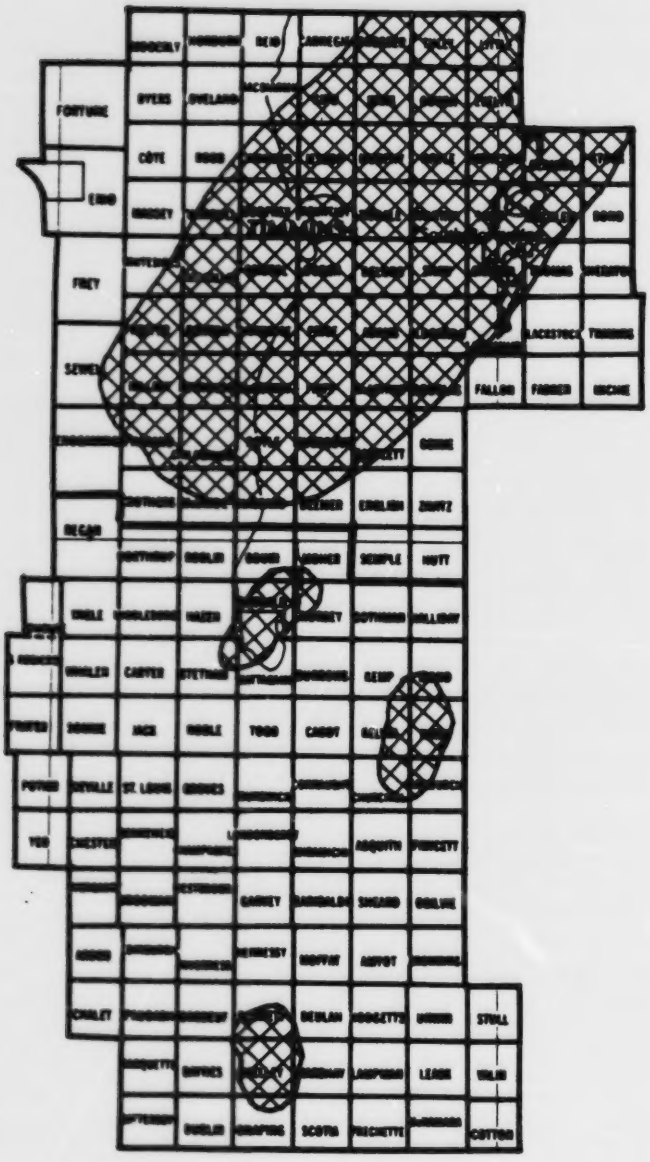
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



LARGE ASPEN TORTRIX

Areas within which defoliation occurred in 1973

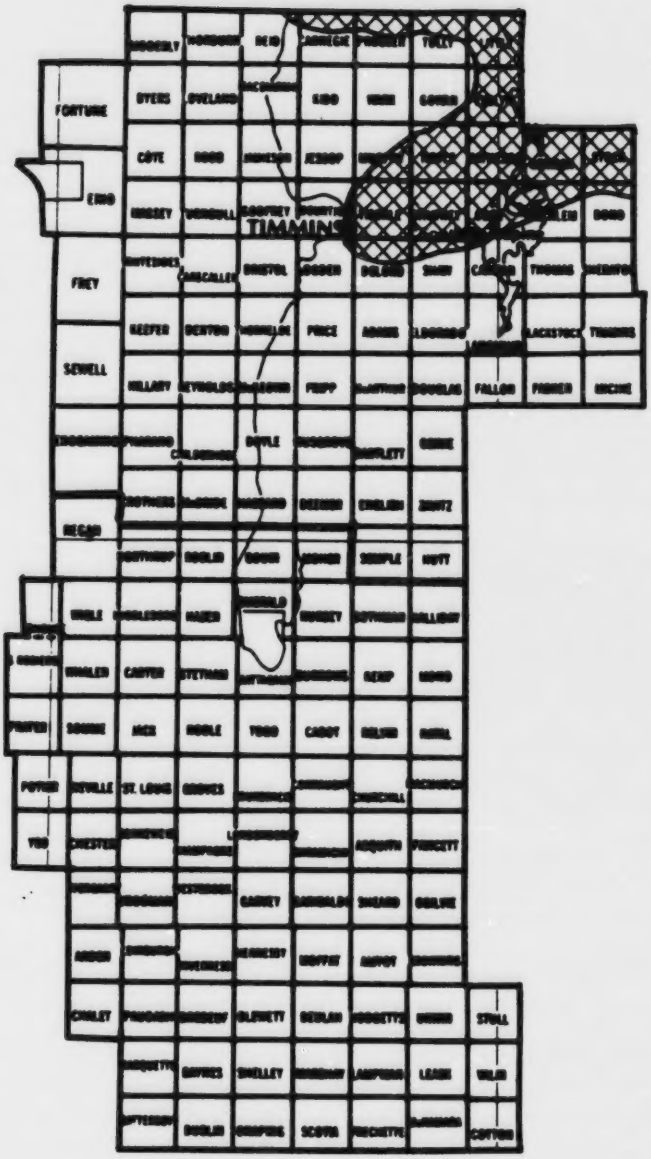
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



LARGE ASPEN TORTRIX

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

Host(s): spruce, bF Major]

Year	Remarks
1950	A pocket of moderate-to-heavy infestation occurred in Moberly and Byers twps in the northwestern corner of the district. Light-to-moderate defoliation was observed in four townships in the Night Hawk Lake area (see map, page 26). After several years of heavy defoliation previous to 1950, heavy mortality was recorded in the western half of the district (see map, page 27).
1951	The budworm population collapsed.
1952-1959	not reported
1960-1961	Small numbers were found at scattered points.
1962	Small populations were encountered in Timmins and Pharand twps.
1963	Populations previously reported in Timmins and Pharand twps collapsed; elsewhere a new pocket of light-to-moderate infestation was discovered in Thorneloe Twp.
1964	A light-to-medium infestation previously reported in Thorneloe Twp collapsed; however, a new low population was discovered in Timmins Twp.
1965	A small population persisted in Timmins Twp. Small numbers were found elsewhere.
1966	Populations increased to light-to-moderate levels in Timmins Twp and a trace population occurred at a few points elsewhere.
1967	trace populations observed at a few scattered points
1968	Populations increased markedly and caused light defoliation at several points in the district.
1969	Population levels increased and caused light defoliation in five townships in the south-central part of the district (see map, page 28).

(cont'd)

Spruce Budworm, *Choristoneura fumiferana* (Clem.) (cont'd)

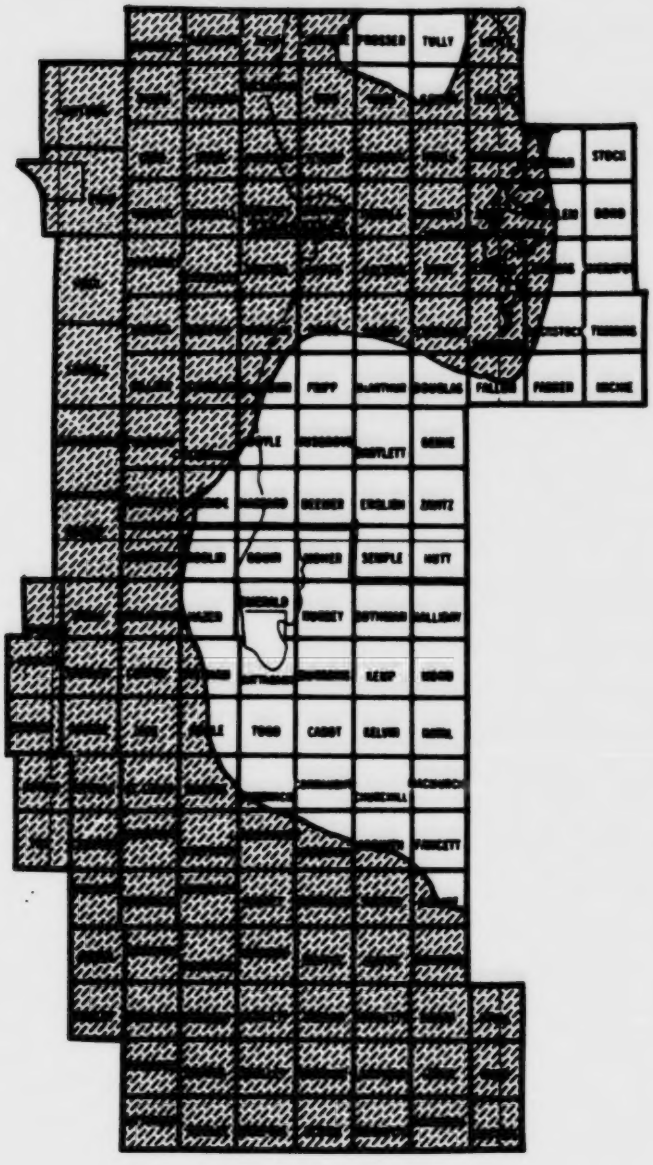
Year	Remarks
1970	Populations increased to a high level and caused severe defoliation in parts of Hassard, Beemer and English twps in the south-central part of the district and in Kenogaming Twp in the southwestern part (see map, page 29).
1971	Heavy infestation persisted and caused moderate-to-severe defoliation in the southern part of the district through a considerably larger area than in the previous year (see map, page 30).
1972	High populations persisted; however, little change occurred in the area within which severe defoliation was recorded (see map, page 31).
1973	Little change in the area infested or in population levels could be detected over the previous year (see map, page 32).
1974	A marked increase in the area of moderate-to-heavy infestation was recorded in the southern part of the district (see map, page 33). Severe defoliation occurred within the heavily infested area.
1975	The area of moderate-to-heavy infestation increased markedly for the second consecutive year and extended through most of the southern half of the district (see map, page 34). Severe defoliation persisted through the area infested.
1976	The area of infestation increased for the third consecutive year; host stands through the entire district were infested (see map, page 35).
1977	Moderate-to-heavy infestations persisted through the district (see map, page 36). Small areas of whole-tree or top mortality caused by repeated budworm defoliation were recorded in Zavitz and Hutt twps in the southeastern corner of the district (see map, page 37).
1978	Infestations persisted and caused moderate-to-severe defoliation of host trees throughout the district (see map, page 38). No change could be determined in the area in which tree mortality was recorded in Zavitz and Hutt twps in 1977 (see map, page 39).

(cont'd)

Spruce Budworm, *Choristoneura fumiferana* (Clem.) (concl.)

Year	Remarks
1979	Heavy infestations persisted and caused moderate-to-severe defoliation of host trees throughout the district (see map, page 40). The incidence of whole-tree or top mortality caused by repeated budworm defoliation increased and expanded through the southern quarter of the district (see map, page 41).
1980	Moderate-to-heavy infestations persisted in virtually all susceptible stands in the district (see map, page 42). The incidence of whole-tree or top mortality increased and expanded northward to include most of the southern half of the district (see map, page 43).

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which balsam fir whole tree and top mortality occurred in 1950

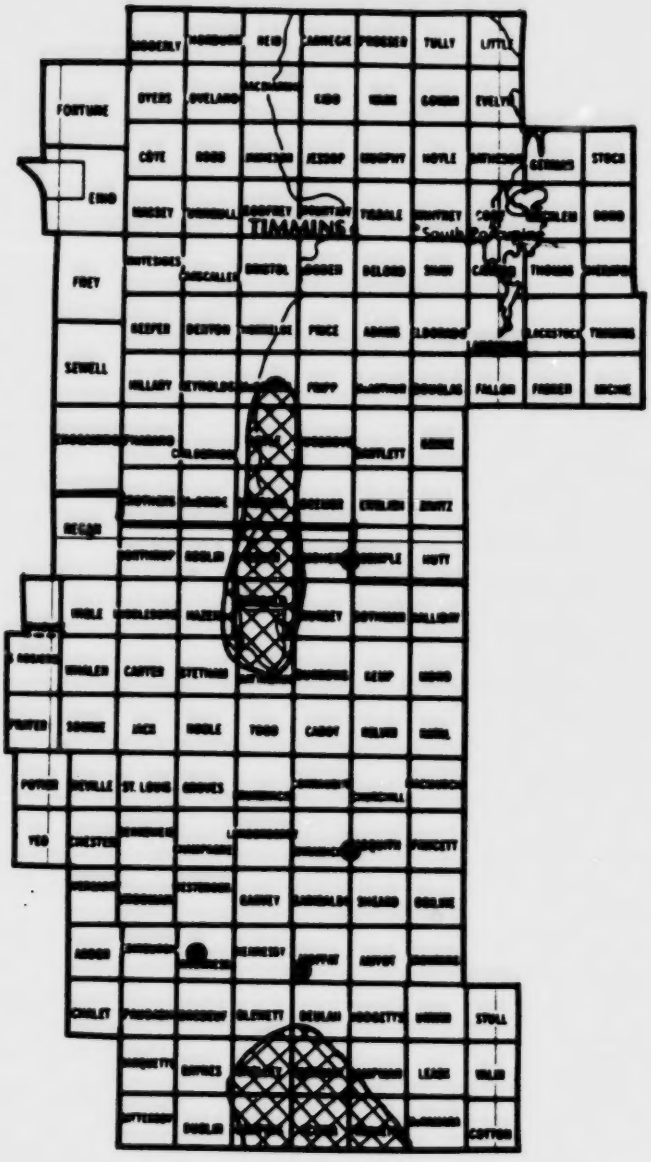
LEGEND

Mortality

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1969

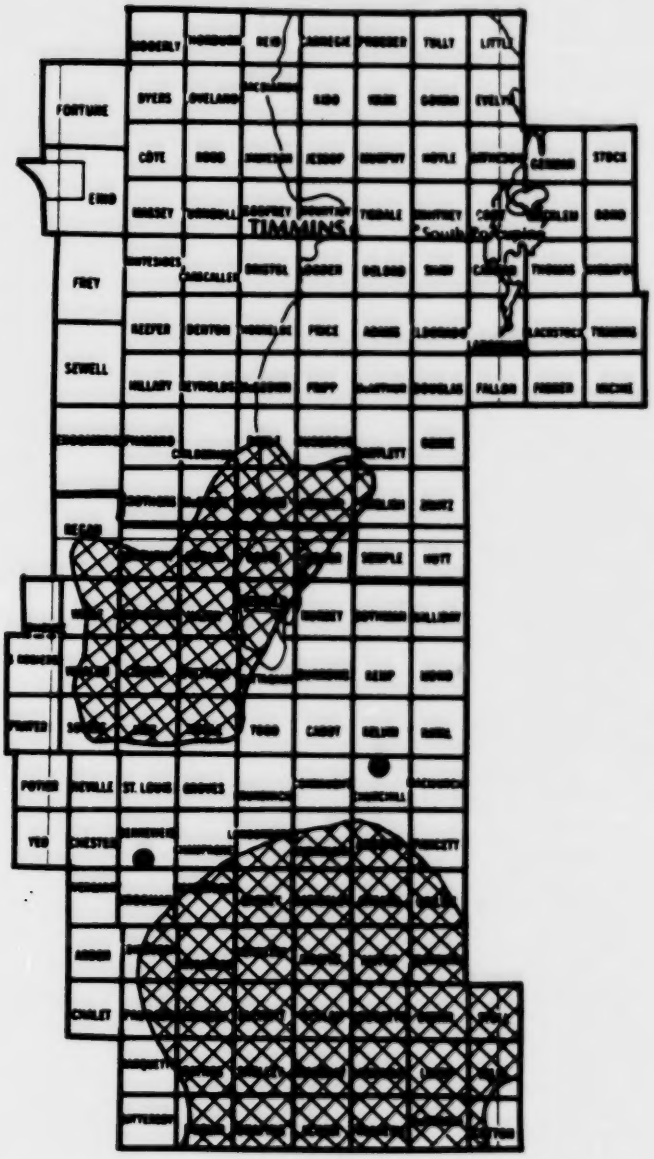
LEGEND

Moderate-to-severe defoliation ● or

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1970

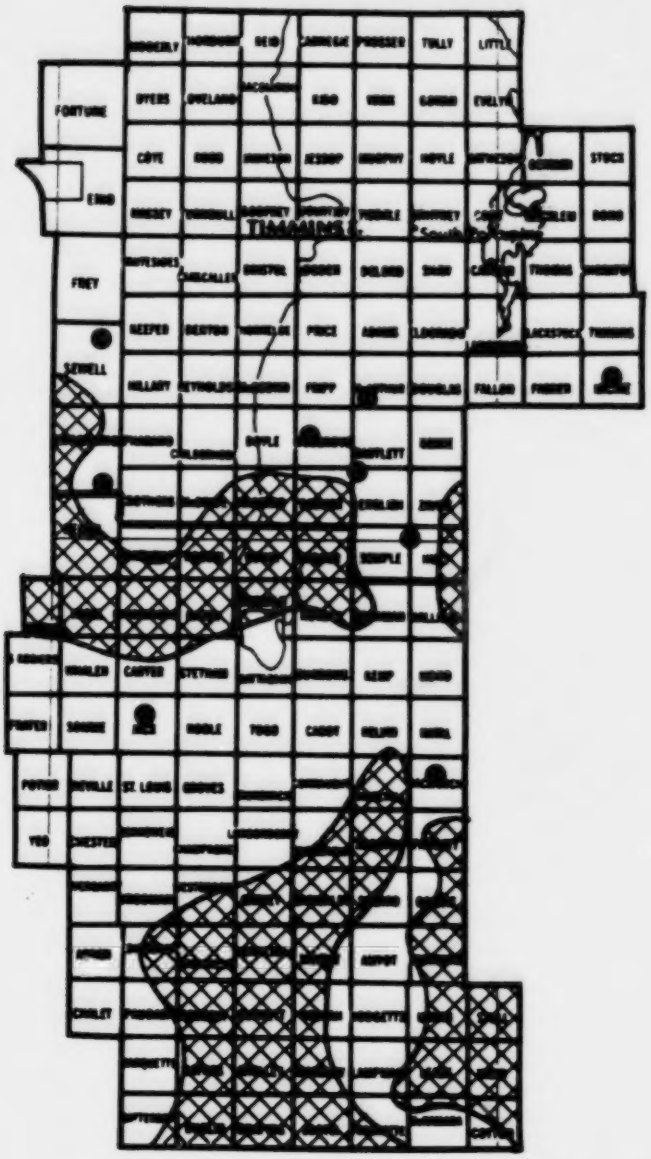
LEGEND

Moderate-to-severe defoliation ● or

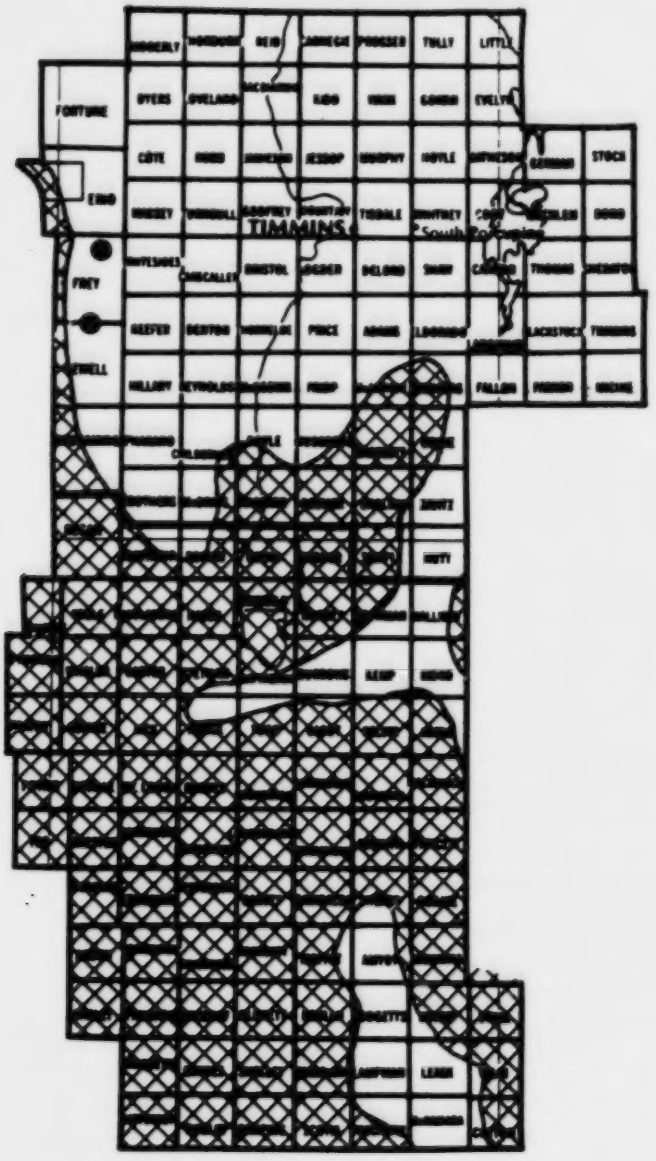
0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1972

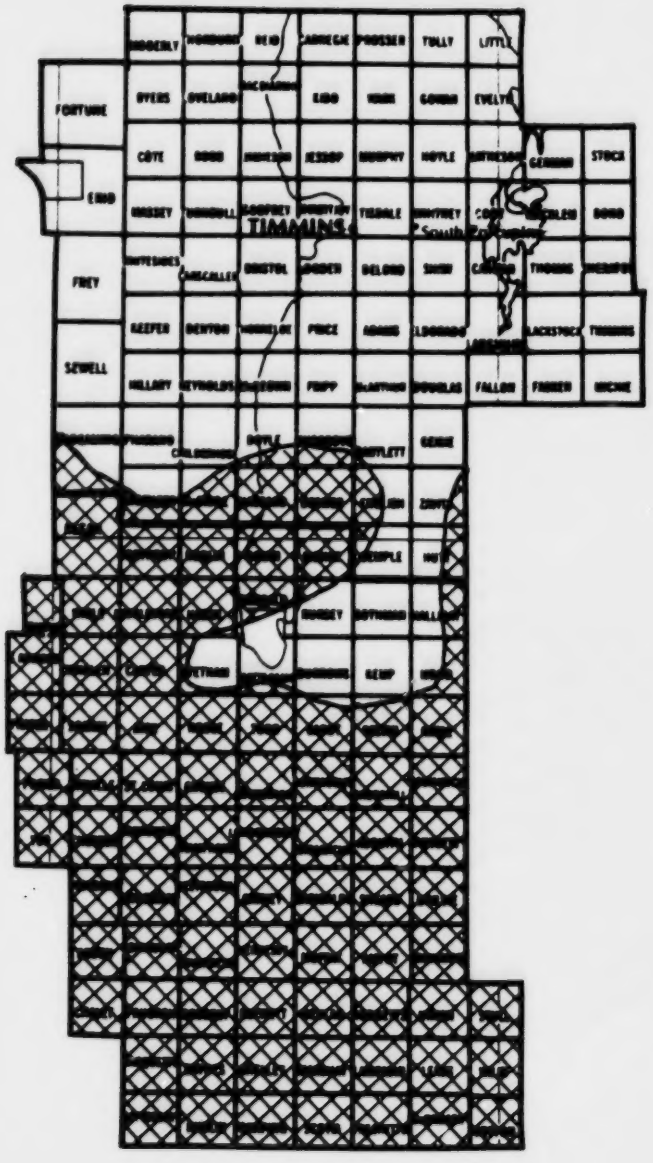
LEGEND

Moderate-to-severe defoliation ● or

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1973

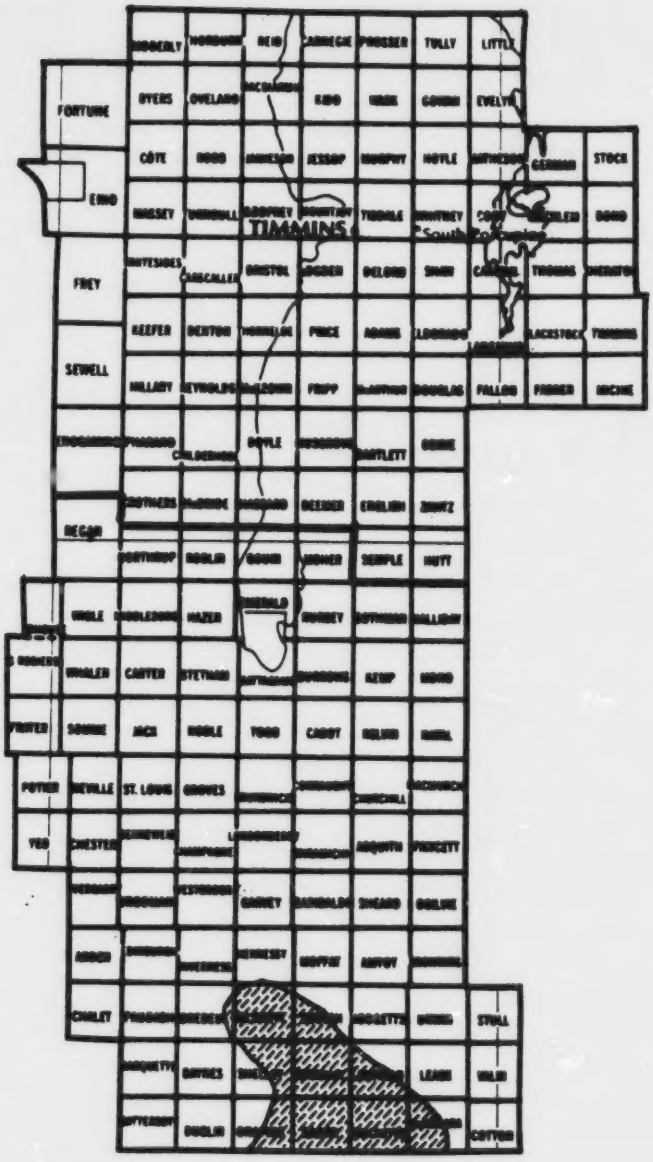
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



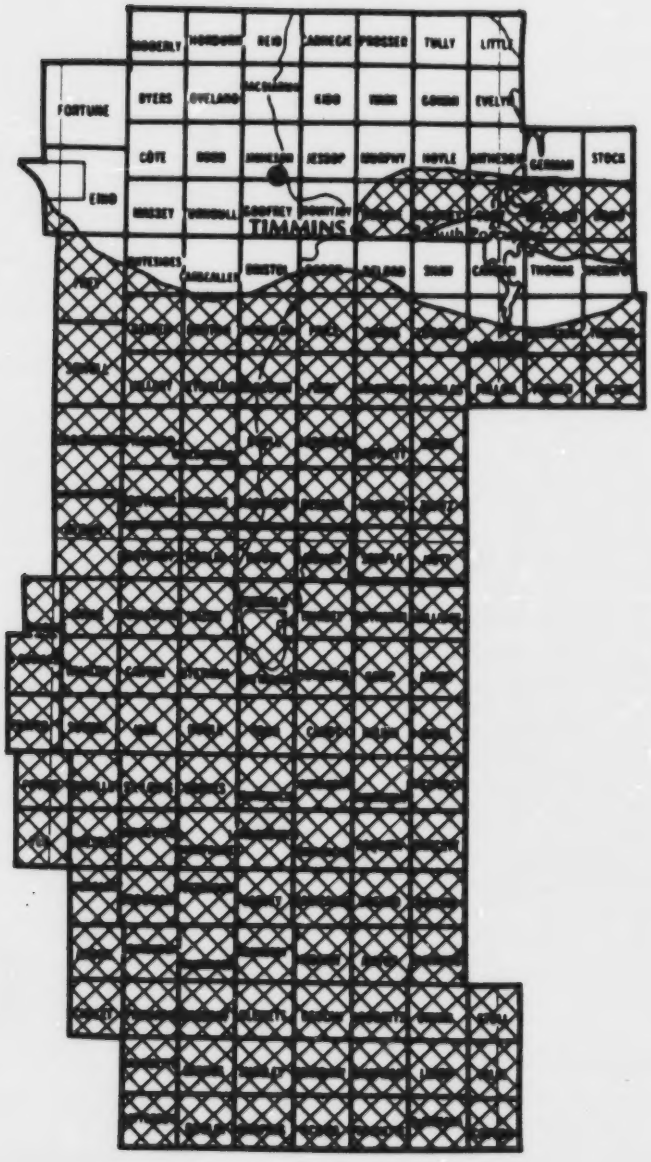
SPRUCE BUDWORM

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1975

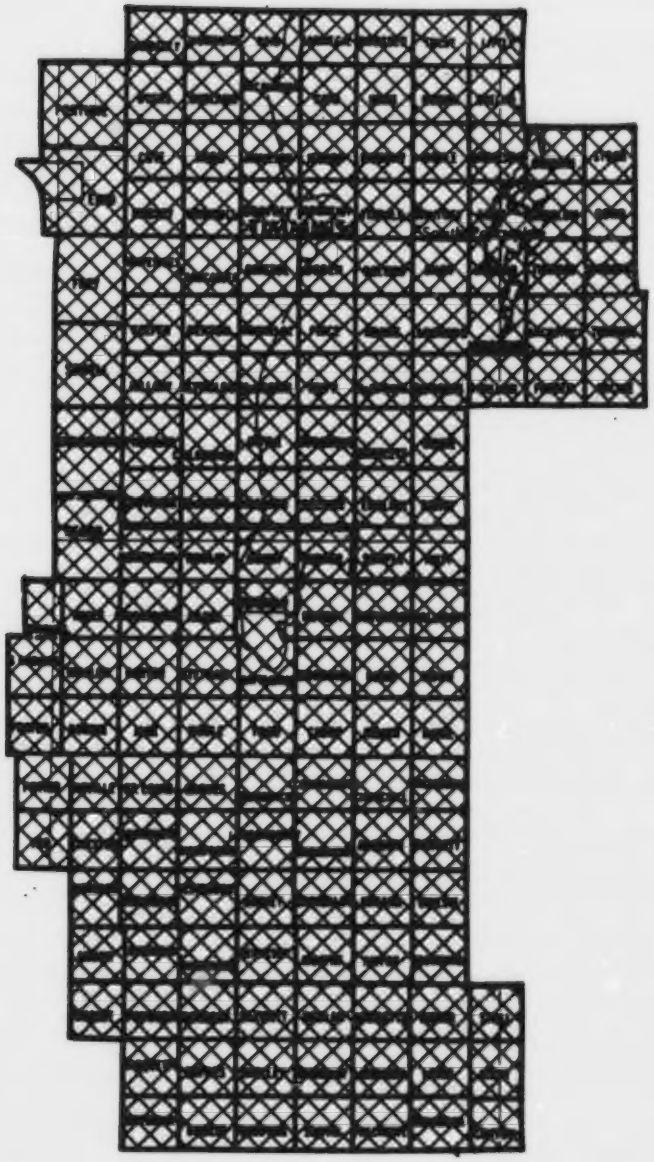
0 KM 40

SCALE

LEGEND

Moderate-to-severe defoliation ● or

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1976

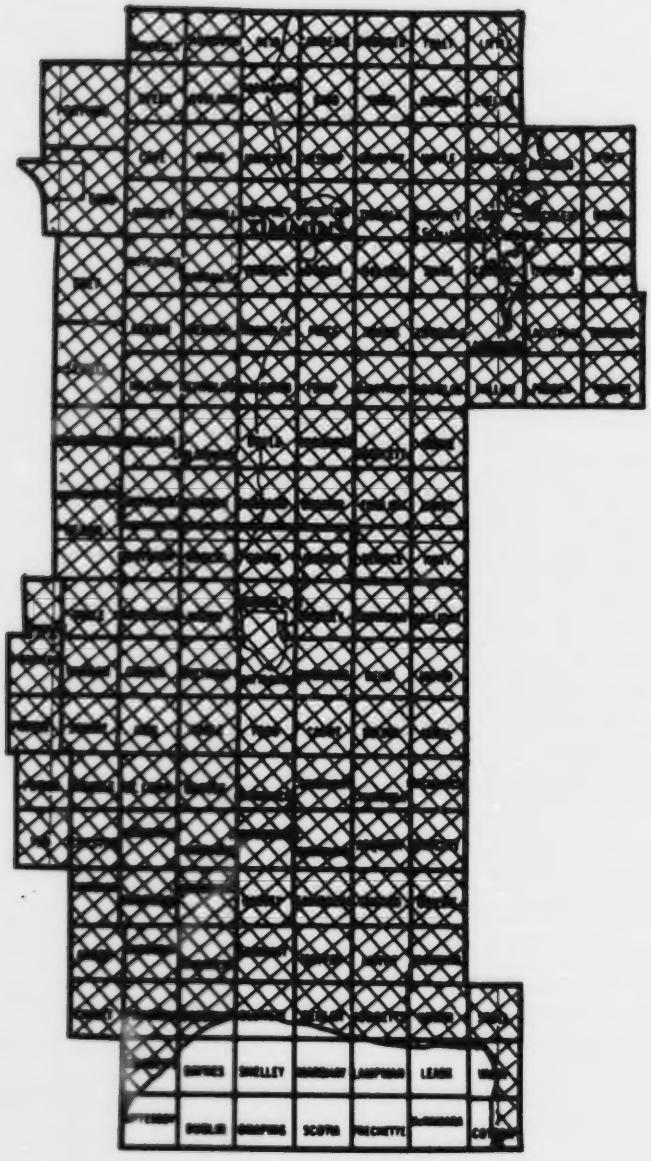
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1977

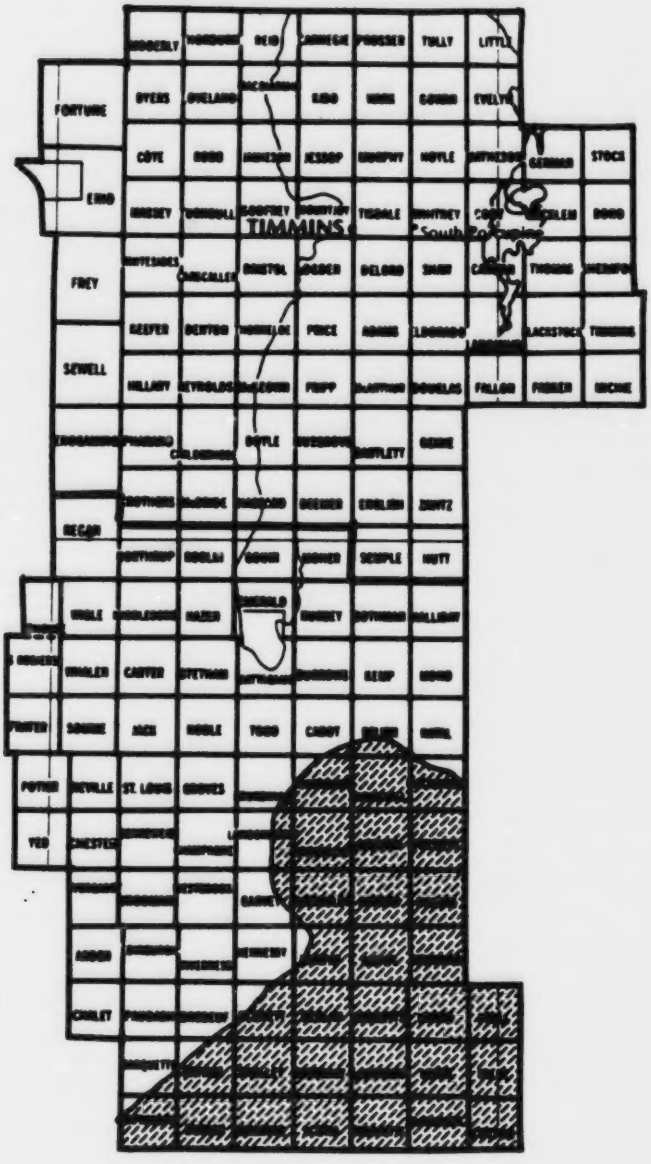
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

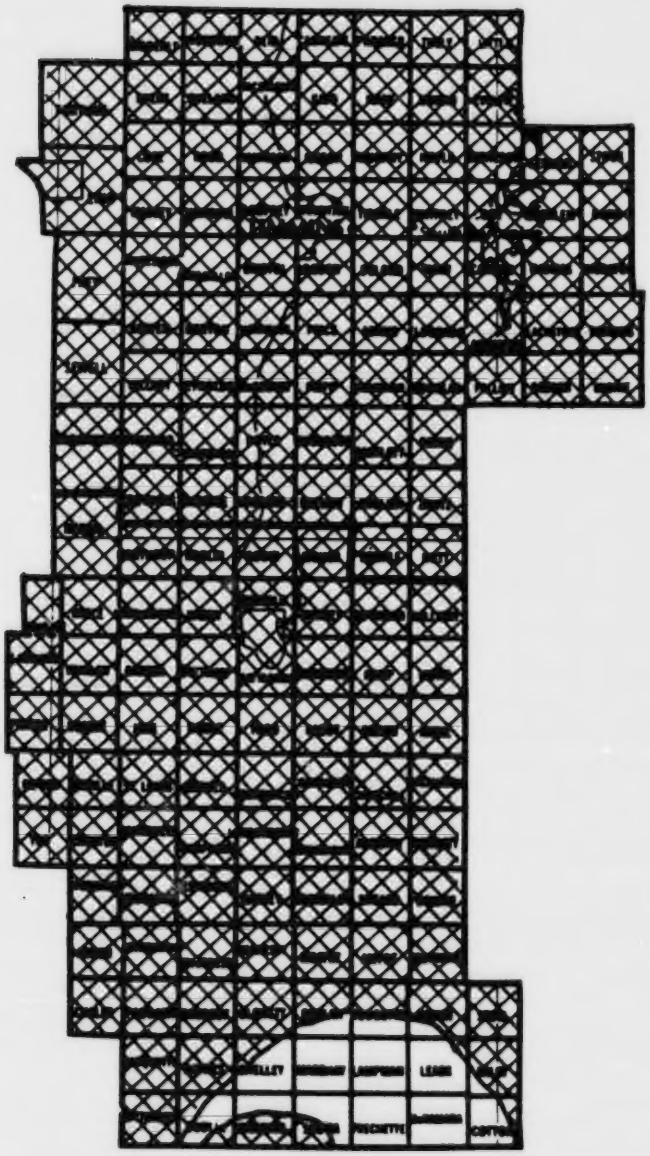
Areas within which balsam fir whole tree and top mortality occurred in 1977

0 KM 40
SCALE

LEGEND

Mortality

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1978

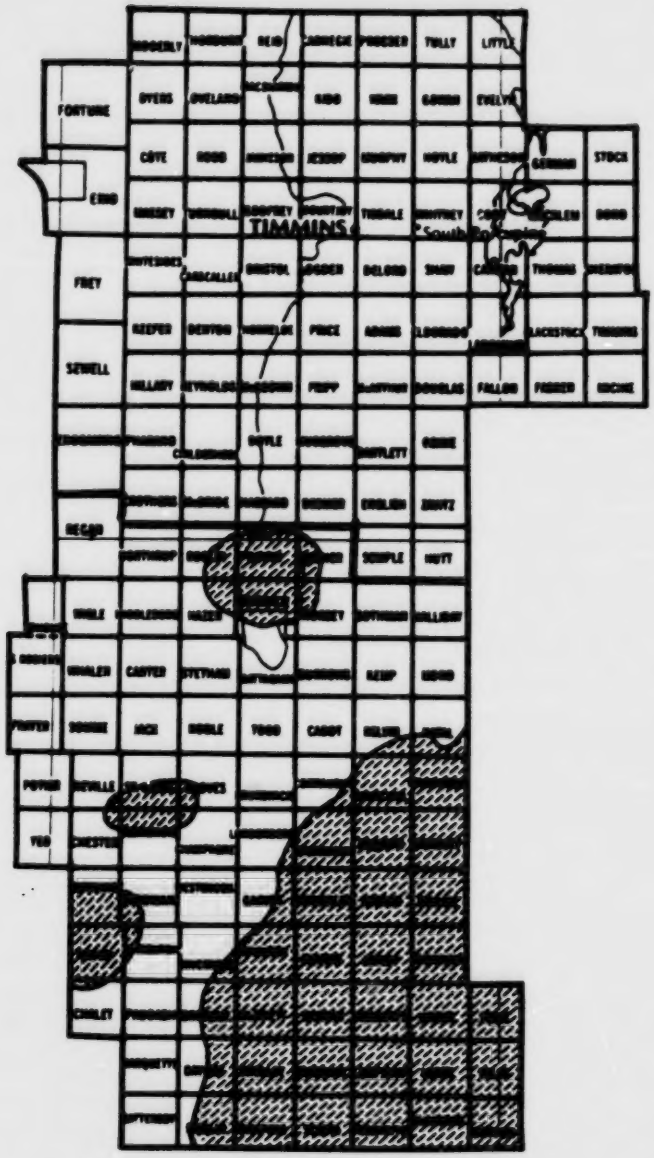
LEGEND

Moderate-to-severe defoliation

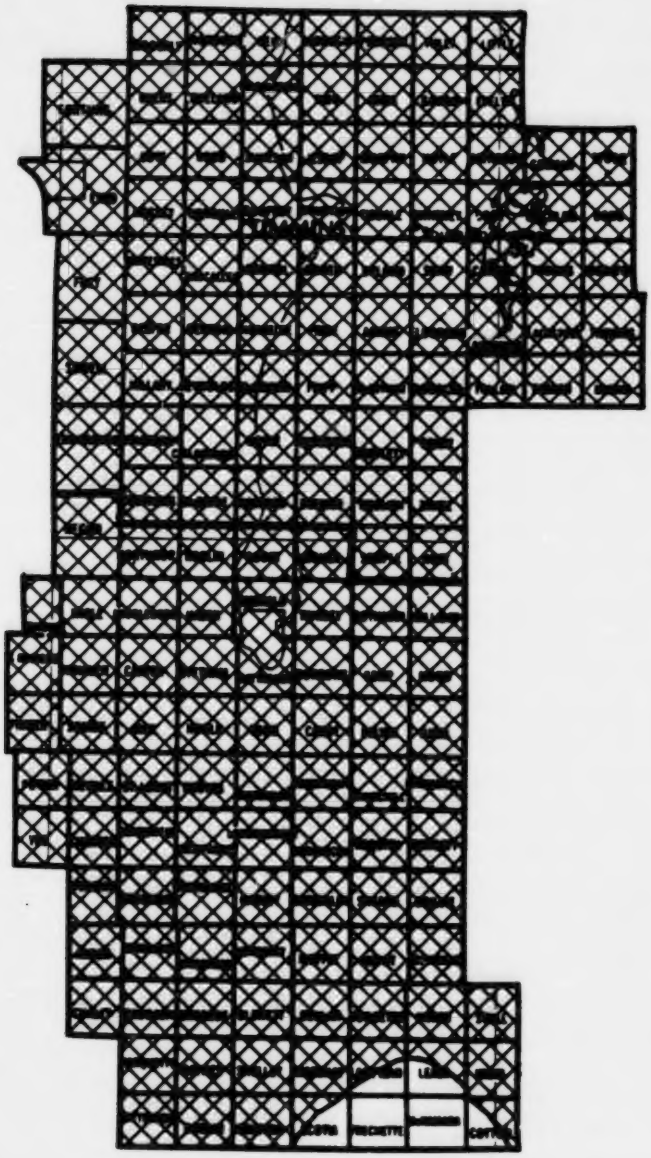
0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1979

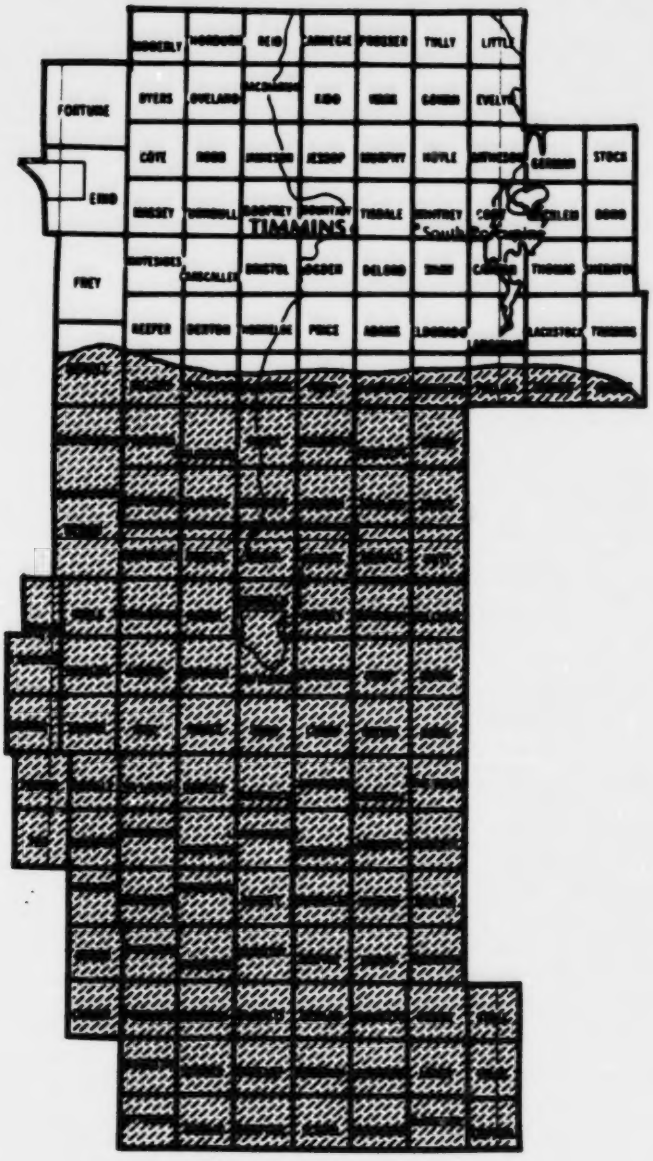
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which balsam fir whole tree and top mortality occurred in 1979

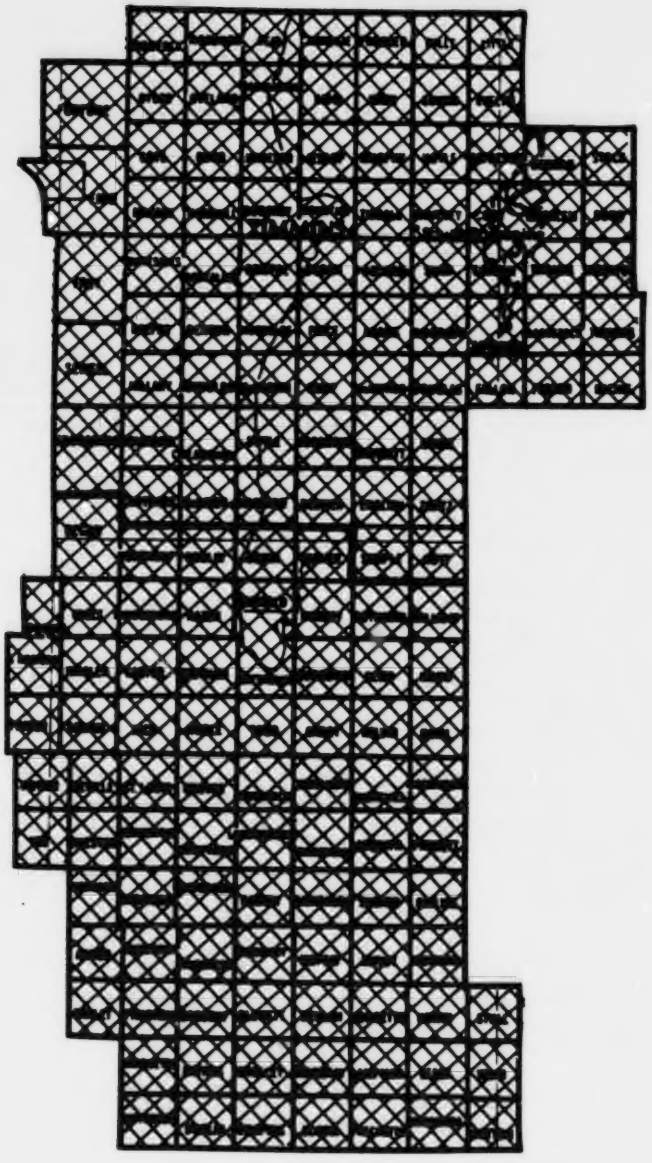
0 KM 40

SCALE

LEGEND

Mortality

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which defoliation occurred in 1980

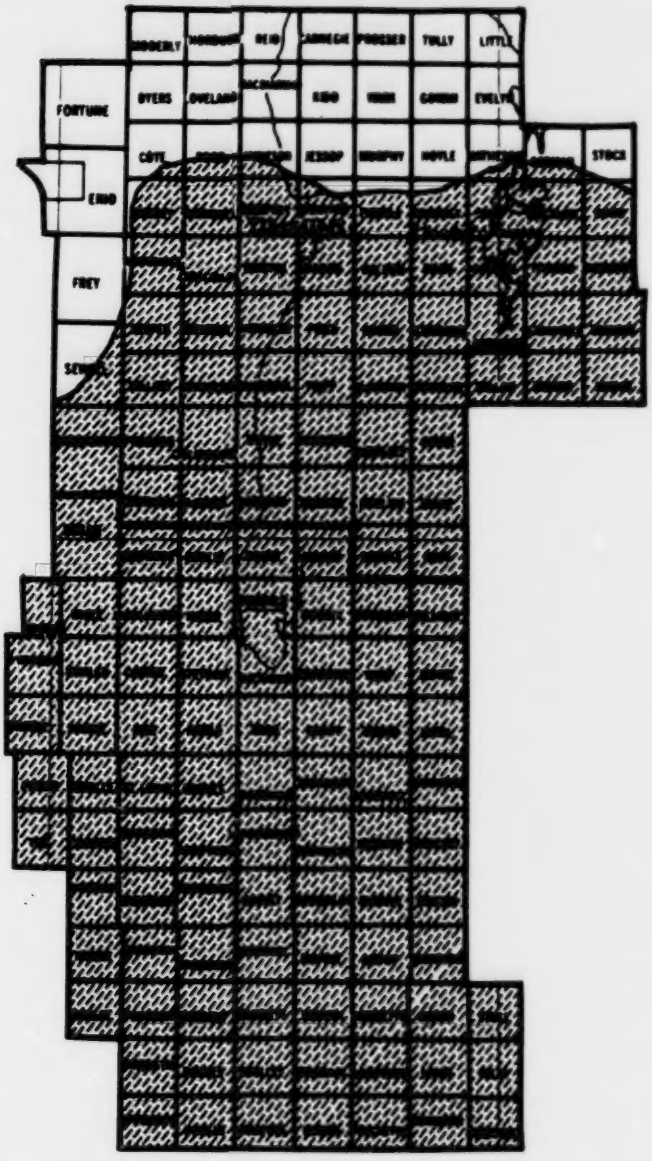
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



SPRUCE BUDWORM

Areas within which balsam fir whole tree and top mortality occurred in 1980

0 KM 40

SCALE

LEGEND

Mortality

Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Host(s): pine [Major]

Year	Remarks
1950-1976	not reported
1977	The first record of this insect in the district was obtained when light damage was found in Thorneloe and Timmins twps.
1978	Small populations were observed at scattered points.
1979	Populations were evident in numerous jack pine plantations and leader mortality was as high as 10% at one point in Timmins District.
1980	Populations increased and caused considerable leader mortality in jack pine plantations through the district.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Host(s): birch [Major]

Year	Remarks
1950-1964	not reported
1965	The first record of this insect in the district was obtained when small numbers were collected in Tisdale Twp.
1966-1967	Heavy defoliation occurred on white birch shade trees in the towns of Timmins and South Porcupine.
1968	Populations declined; however, an increase in distribution was recorded when small numbers were found in Pharand, Timmins and Deloro twps.
1969	Populations remained at a low level.
1970	Populations increased and caused light damage at several points in the district.
1971-1974	Little change in population levels could be detected.
1975	Populations increased and caused as much as 75% defoliation of ornamentals in urban areas.

(cont'd)

Birch Leafminer, *Fenusa pusilla* (Lep.) (concl.)

Host(s): birch [Major]

Year	Remarks
1976	Heavy infestations recurred in urban areas and destroyed close to 100% of the foliage on ornamentals in the town of Timmins.
1977	Populations increased and caused moderate-to-severe defoliation of host trees at many locations in the district.
1978	Heavy infestations persisted at many points in the district.
1979	Populations decreased generally; however, heavy infestations persisted in the towns of Timmins and South Porcupine.
1980	Severe defoliation recurred in the Timmins and South Porcupine areas.

American Aspen Beetle, *Gonioctena americana* (Schaef.)

Host(s): poplar Major]

Year	Remarks
1950-1951	not reported
1952	Moderate-to-severe defoliation was noted on small poplars west of the town of Timmins.
1953	small numbers observed at numerous points
1954	not reported
1955	Light-to-moderate defoliation occurred in Tisdale Twp.
1956	Small populations were observed at 11 scattered points.
1957	Only trace populations could be found.
1958	Populations increased throughout the district and caused moderate-to-severe defoliation at one point in Adams Twp.

(cont'd)

American Aspen Beetle, *Gonioctena americana* (Schaef.) (concl.)

Host(s): poplar Major]

Year	Remarks
1959	Light-to-moderate defoliation was recorded in Robb Twp. Small numbers were observed at several points elsewhere.
1960	Light-to-moderate defoliation was evident in Tisdale Twp, and small numbers were observed at several other locations.
1961	Small populations occurred at numerous points.
1962	Populations increased and caused light-to-moderate defoliation at several locations in the southern part of the district.
1963	Light-to-moderate defoliation was evident in German Twp, and light damage was observed at numerous points elsewhere.
1964	A medium infestation persisted in German Twp and new medium infestations were found in Hillary, Ogden and Thorneloe twps. Light infestations were common elsewhere.
1965	Medium infestations were evident in Hillary, Keefer and Whitesides twps and small pockets of light damage were observed at several points elsewhere.
1966-1967	Little change in population levels was observed; scattered pockets of light-to-moderate defoliation persisted.
1968	Light damage occurred in Hillary and German twps; small numbers were noted elsewhere.
1969-1973	not reported
1974	Populations increased and caused moderate-to-severe defoliation in German Twp.
1975	Small pockets of light-to-moderate defoliation were observed in Matheson and German twps.
1976-1980	Pockets of moderate-to-severe defoliation were encountered at scattered points.

Pine Engraver, *Ips pini* (Say)

Host(s): pine, spruce [Major]

Year	Remarks
1950-1960	not reported
1961	A heavy infestation of this insect was found causing serious damage in a red pine plantation in Sheraton Twp. The quality of the site and origin of the planting stock may have been partially responsible for the beetle attack. Tree mortality reached 55% in the area and 49% of the living trees remaining were infested.
1962	High populations recurred in a red pine plantation in Sheraton Twp. A sanitation project was carried out and all dead or infested trees were removed.
1963	Populations of this insect declined to a low level.
1964	Only a trace of the insect could be found.
1965-1980	not reported

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

Host(s): aspen, deciduous [Major]

Year	Remarks
1950	Pockets of light infestation were recorded at six scattered points.
1951	Small areas of light-to-medium infestation occurred at four points in the district (see map, page 48).
1952	Populations increased, expanded and caused moderate-to-severe defoliation in the four areas in which light-to-moderate damage was previously reported (see map, page 49).
1953	Populations continued to increase and spread, causing moderate-to-severe defoliation at 11 points (see map, page 50).

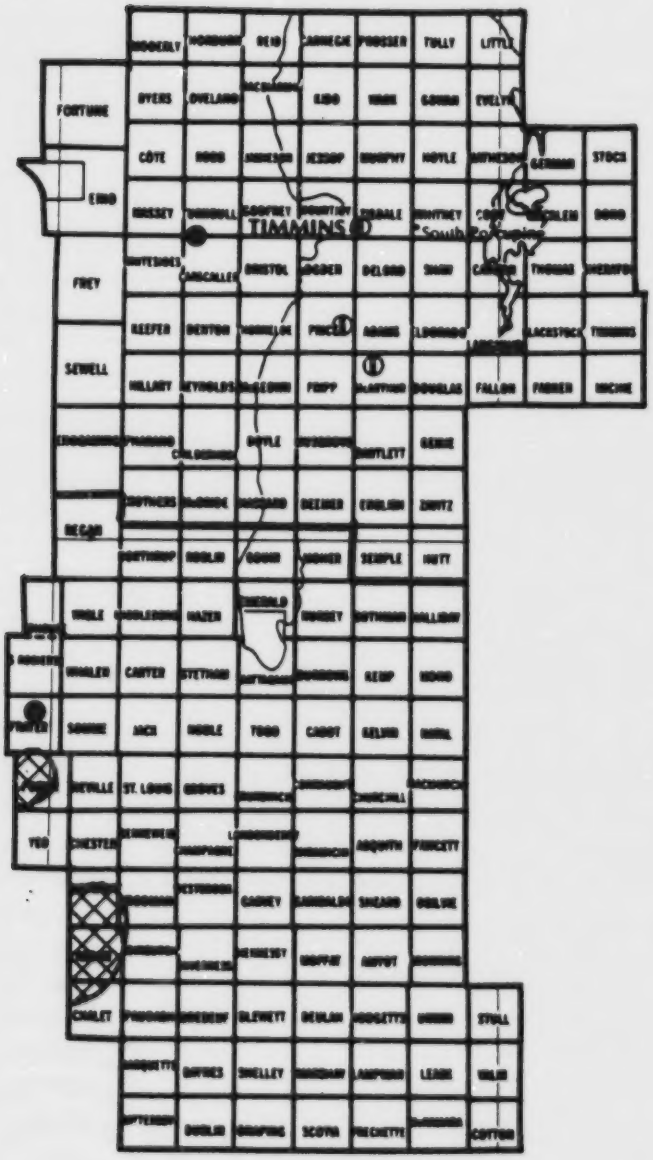
(cont'd)

Forest Tent Caterpillar, *Malacosoma disstria* Hbn. (concl.)

Host(s): aspen, deciduous [Major]

Year	Remarks
1954	Over all, little change occurred in the total area of infestation. Although pockets of infestation reported the previous year in the south-central part of the district expanded and coalesced, an area of moderate-to-heavy infestation reported in the western part was eliminated by late spring frosts shortly after the eggs hatched (see map, page 51).
1955	Populations decreased to light intensity, leaving areas of light-to-moderate infestation confined to the eastern and southeastern parts of the district (see map, page 52).
1956	Light-to-moderate infestations persisted in the southeastern part of the district (see map, page 53).
1957	Populations collapsed; no caterpillars could be found.
1958-1961	not reported
1962	small numbers found in German Twp
1963	not reported
1964	Light infestations occurred in Robb, Tisdale and Whitney twps.
1965	Populations collapsed and only small numbers of larvae could be found.
1966-1970	not reported
1971	A trace population was found in German Twp.
1972	Populations increased and caused light defoliation in German Twp.
1973	A light infestation persisted in German Twp.
1974-1977	not reported
1978	A small area of moderate-to-heavy infestation was found in the northeastern part of the district (see map, page 54).
1979-1980	not reported

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1951

LEGEND

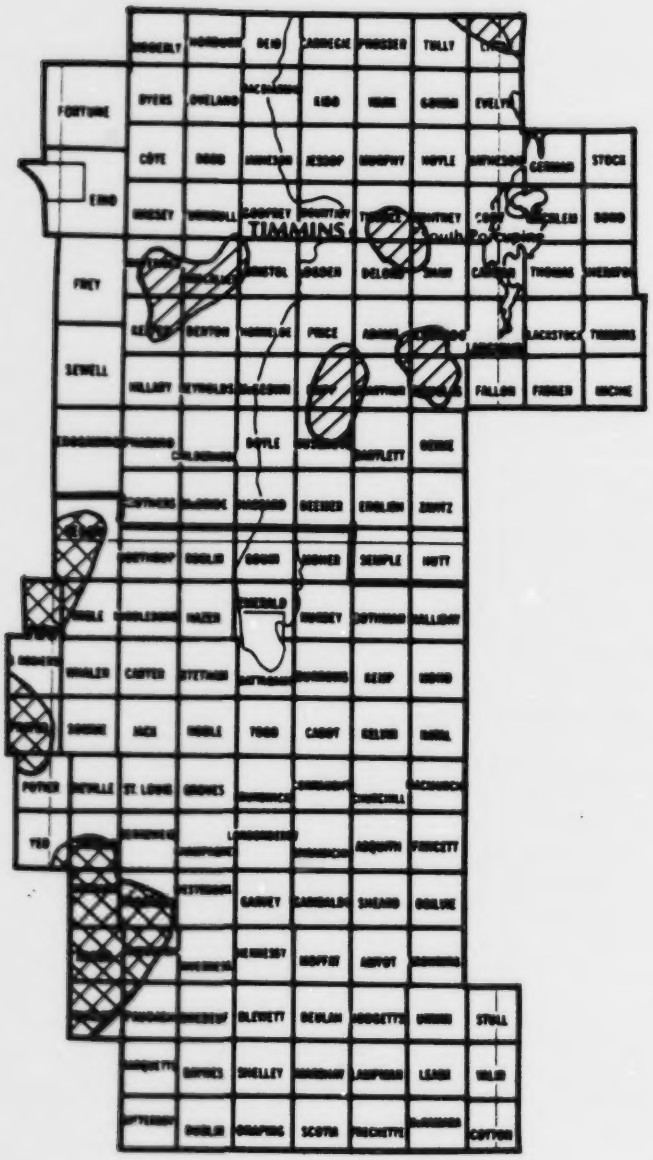
Light defoliation ①

Moderate-to-severe defoliation ● or ▨

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1952

LEGEND

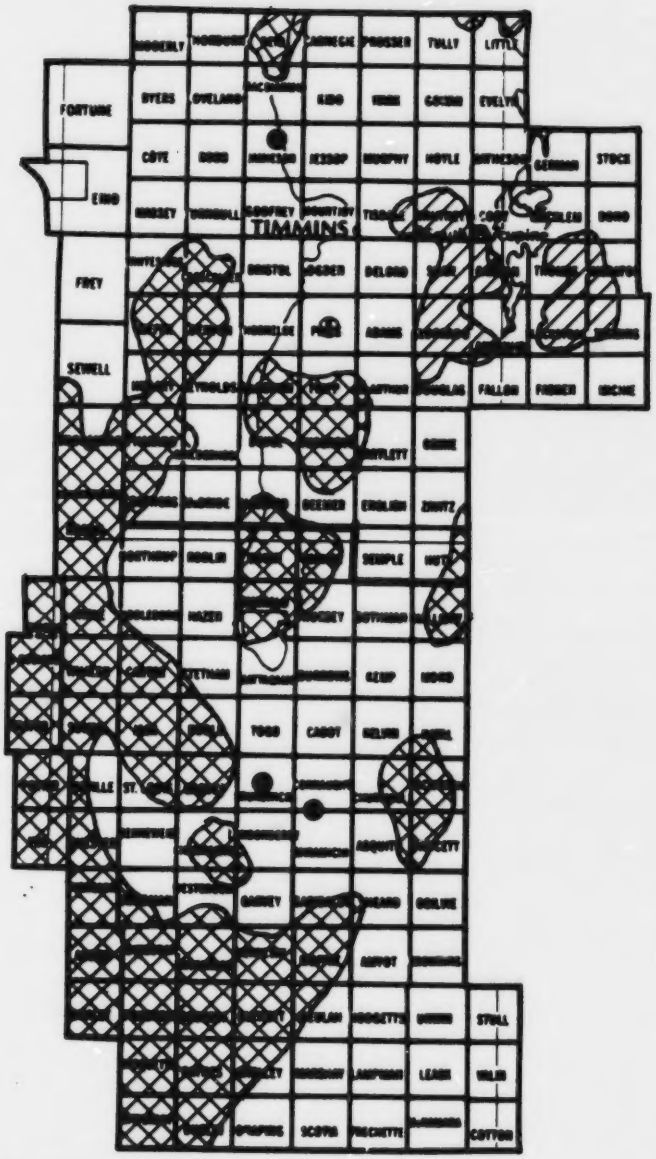
Light defoliation

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1953

LEGEND

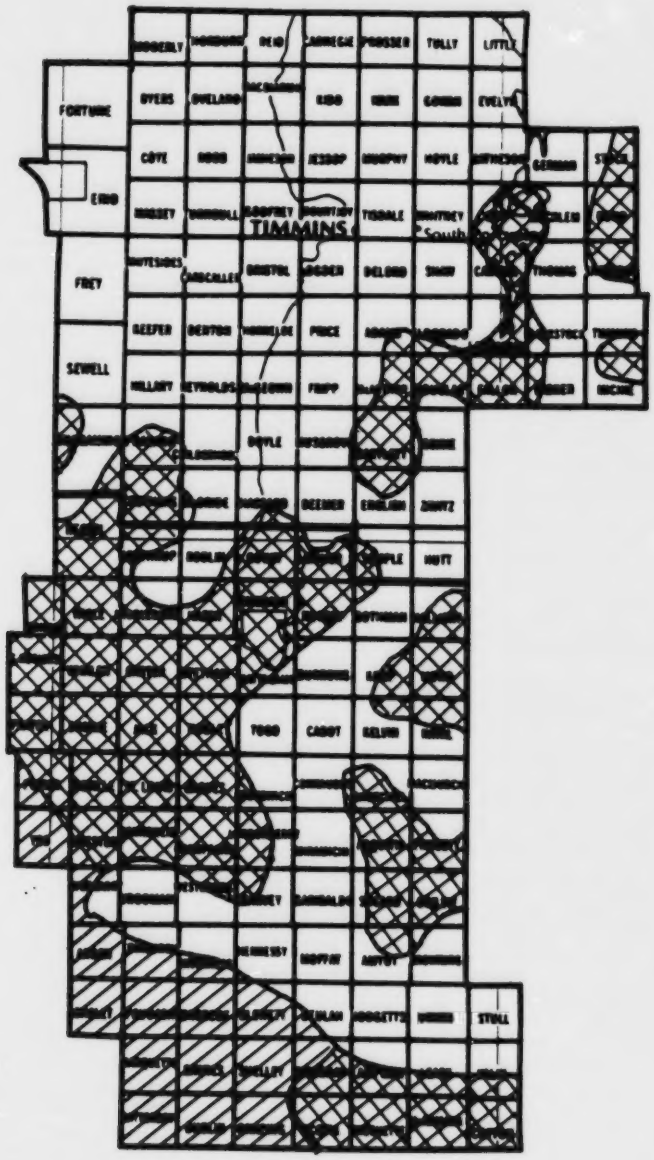
Light defoliation ◐ or

Moderate-to-severe defoliation ● or

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1954

LEGEND

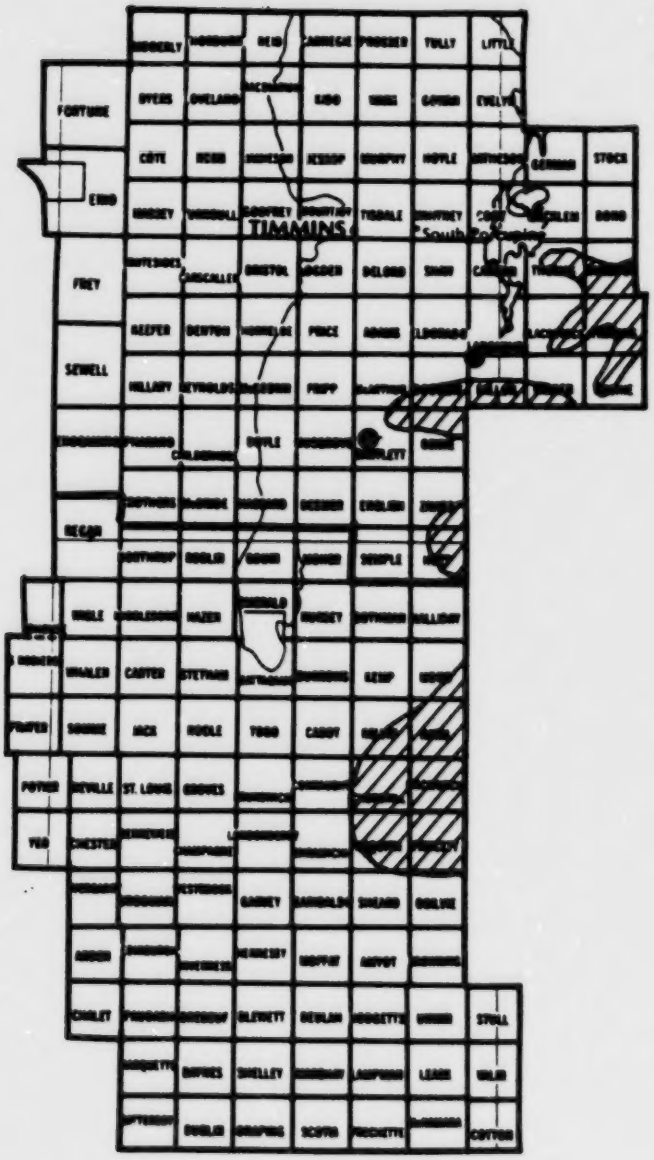
Light defoliation

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1955

LEGEND

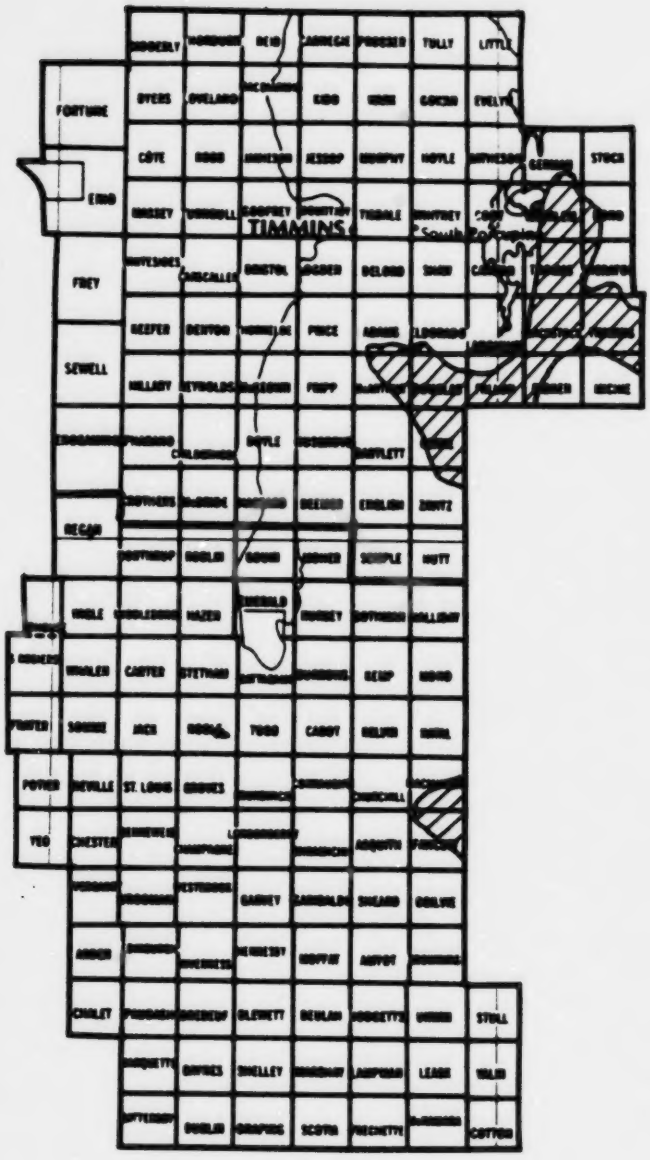
Light defoliation

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



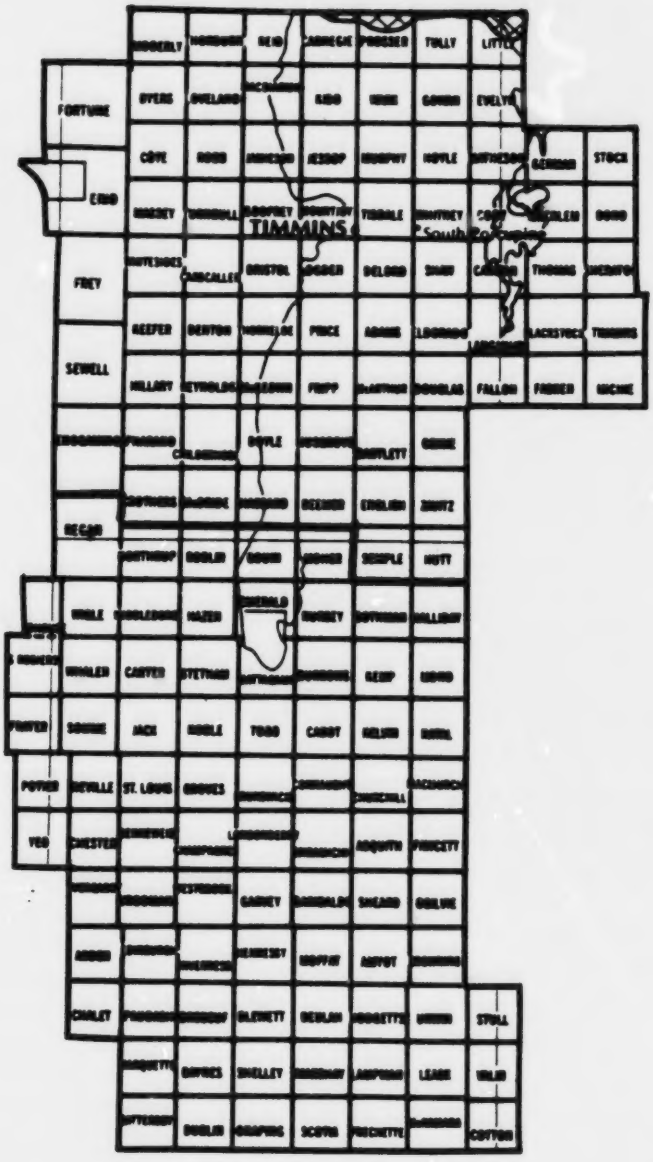
FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1956

LEGEND

Light defoliation

TIMMINS AND GOGAMA DISTRICTS



FOREST TENT CATERPILLAR

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

Whitespotted Sawyer, *Monochamus scutellatus* (Say)

Host(s): tA, wB [Major]

Year	Remarks
1950-1955	not reported
1956	Populations were common in decadent trees.
1957-1963	not reported
1964	Populations were commonly observed adjacent to log dumps and in decadent trees.
1965-1966	not reported
1967	Larvae were collected from recently cut timber.
1968-1979	not reported
1980	Severe damage was caused by adults feeding on branches and twigs of trees adjacent to log dumps at several points.

Balsam Fir Sawfly, *Neodiprion abietis* complex

Host(s): bF, spruce [Major]

Year	Remarks
1950-1960	not reported
1961	Small numbers of colonies were observed on spruce in Tisdale Twp.
1962	not reported
1963-1964	Trace populations occurred at widely separated points.
1965	A small pocket of medium infestation occurred near the town of South Porcupine. Trace populations were observed elsewhere.
1966	The medium infestation in the South Porcupine area declined to light intensity. Trace numbers persisted at other widely separated points.
1967	Small numbers of colonies were observed in Tisdale and Hillary twps.
1968	Populations increased and caused light defoliation in Tisdale, Whitney, Hillary and Timmins twps.
1969-1980	not reported

Pine Sawflies, *Neodiprion nanulus nanulus* Schedl. and
N. pratti banksianae Roh.

Host(s): jP [Major]

Year		Remarks
1950-1955		not reported
1956	*N. pratti banksianae*	trace populations only
1957-1959		not reported
1960	*N. pratti banksianae*	Light damage was noted in Ogden Twp and trace populations were commonly observed at several other points.
	N. nanulus nanulus	A light infestation occurred in Ogden Twp and scattered colonies were encountered in Tisdale, Murphy, German, Macklem and Mountjoy twps.
1961	*N. pratti banksianae*	Light damage recurred in Ogden Twp and trace populations were evident in German, Evelyn and Murphy twps.
	N. nanulus nanulus	Little change in population levels was noted; scattered colonies were observed at several points.
1962	*N. pratti banksianae*	Populations collapsed except in Ogden Twp, where small numbers were found.
	N. nanulus nanulus	Small numbers of colonies were observed at scattered points.
1963	*N. nanulus nanulus*	Light infestations were encountered in German Twp; small numbers of colonies were observed at scattered points elsewhere.
1964	*N. nanulus nanulus*	Populations declined to a trace level.
1965		not reported
1966	*N. nanulus nanulus*	A new light infestation was discovered in Hillary Twp.

(cont'd)

Pine Sawflies, *Neodiprion nanulus nanulus* Schedl., and *N. pratti banksianae* Roh. (concl.)

Host(s): jP [Major]

Year		Remarks
1967	*N. nanulus nanulus*	An increase in the distribution of this sawfly was noted when colonies were commonly observed in German, Robb, Whitney, Tisdale, Matheson and Hillary twps.
1968	*N. nanulus nanulus*	Populations declined; only small numbers of colonies could be found.
1969-1976		not reported
1977	*N. nanulus nanulus*	Small numbers were observed at scattered points.
1978-1980		not reported

Redheaded Jack Pine Sawfly, *N. virginianus* complex

Host(s): jP [Major]

Year	Remarks
1950	small numbers of colonies found at scattered points
1951	not reported
1952	A light infestation was observed at one point in Massey Twp.
1953	a pocket of light-to-medium infestation was found in Timmins Twp; scattered colonies were observed elsewhere.
1954	Populations increased and caused approximately 60% defoliation at one point in German Twp. Small numbers of colonies were noted at scattered points elsewhere.
1955	A marked decline in populations occurred; only a trace of the sawfly could be found.
1956-1957	Populations remained at a trace level.

(cont'd)

Redheaded Jack Pine Sawfly, *N. virginianus* complex (concl.)

Host(s): JP [Major]

Year	Remarks
1958	Populations increased and caused light-to-moderate defoliation of host trees in Robb and Tisdale twps.
1959	Light infestations persisted in Robb and Tisdale twps.
1960	Populations increased and caused heavy damage in Robb Twp. Small numbers of colonies were commonly observed at several other points.
1961	Populations decreased markedly; only small numbers of colonies were encountered in Robb Twp where a heavy infestation was reported the previous year. Only a few colonies could be found at other points surveyed.
1962	Populations increased and caused light-to-moderate defoliation in Robb and Tisdale twps.
1963-1964	Little change occurred in population levels.
1965	Colonies increased in number and caused light-to-moderate defoliation in Tisdale and Robb twps.
1966	not reported
1967	Light damage was noted in Robb, Tisdale, Denton, Fripp and Bartlett twps.
1968	Light infestations recurred in Robb and Tisdale twps and small pockets of light damage were commonly observed through the southern part of the district.
1969	Little change in population levels could be detected.
1970-1974	not reported
1975	Populations increased sharply and caused severe defoliation of scattered trees in plantations at several points.
1976-1977	Moderate-to-severe defoliation recurred on scattered trees in several plantations.
1978	Populations declined abruptly and only a few colonies could be found.
1979	not reported
1980	Populations increased and caused light damage in German Twp.

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.)

Host(s): tA [Major]

Year	Remarks
1950	not reported
1951	Large populations were encountered in young stands throughout the district.
1952-1953	Populations declined to a low level.
1954-1956	not reported
1957	A trace population was encountered at one point.
1958-1959	not reported
1960-1961	Small populations were commonly observed throughout the district.
1962	Populations increased and were responsible for moderate-to-severe leaf mining at several points.
1963	Large populations persisted.
1964	Light-to-moderate leaf damage was noted in Denton and Hillary twps. Elsewhere populations declined to a low level.
1965	Populations increased to a heavy intensity in Denton and Hillary twps. Small numbers persisted through the remainder of the district.
1966	Heavy infestations persisted in Denton and Hillary twps and a new heavy infestation was noted in Thorneloe Twp. Small numbers were common through the remainder of the district.
1967	Populations declined to a medium level in Denton, Hillary and Thorneloe twps. Small numbers recurred elsewhere.
1968	Populations declined to a low level.
1969-1971	not reported
1972-1974	small pockets of damage encountered at a few points

(cont'd)

Aspen Leafblotch Miner, *Phyllonorycter ontario* (Free.) (concl.)

Host(s): tA [Major]

Year	Remarks
1975	Populations increased and caused conspicuous foliar damage at many locations.
1976-1977	Extensive leaf mining recurred at several points.
1978	Populations were widely distributed; however, a decline in numbers was evident.
1979	Pockets of light-to-medium infestation were commonly observed.
1980	Populations declined to a low level.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

Host(s): spruce [Major]

Year	Remarks
1950	Heavy infestation caused approximately 40% defoliation of open-grown trees in German, Whitney and Pharand twps. Light damage was observed at numerous points elsewhere.
1951	Heavy infestations persisted in German and Whitney twps. Light infestations were found in McKeown, Shaw and Tisdale twps.
1952	Moderate-to-severe defoliation of ornamental trees occurred in Timmins.
1953	A moderate-to-heavy infestation occurred in the Timmins area. Light damage was evident at numerous points elsewhere.
1954	Moderate-to-severe damage occurred in Whitney Twp and light-to-moderate defoliation was observed at scattered points elsewhere.
1955	Populations declined generally and only light damage could be found in Whitney Twp, where moderate-to-severe defoliation had been previously reported.

(cont'd)

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

Host(s): spruce [Major]

Year	Remarks
1956	Light-to-moderate damage persisted in Whitney Twp; only small numbers could be found elsewhere.
1957	Only small numbers could be found.
1958	Moderate-to-severe defoliation of white and black spruce trees was commonly noted in Whitney, Tisdale and Mountjoy twps. Small populations were encountered at scattered points elsewhere.
1959	As a result of medium-to-heavy infestations, defoliation in Tisdale and Matheson twps ranged from 40% to 80%.
1960	Varying degrees of defoliation were observed on ornamental and shade trees in the Timmins-Porcupine area.
1961	Populations declined and only small numbers of larvae could be found.
1962-1963	Populations remained at a low level.
1964-1965	not reported
1966	Moderate-to-severe defoliation occurred on white spruce ornamentals in the town of Timmins. Small populations were encountered at scattered points elsewhere.
1967-1969	Varying degrees of infestation occurred on white and black spruce ornamentals in the towns of Timmins and South Porcupine. Small numbers were encountered at numerous points elsewhere.
1970-1971	Varying degrees of infestation persisted on spruce ornamentals in towns and villages; only small numbers could be found elsewhere.
1972-1973	Only small numbers could be found.
1974	Populations increased and caused severe defoliation of ornamental spruce in the town of Timmins. Small numbers were observed on open-grown host trees elsewhere.

(cont'd)

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.) (concl.)

Host(s): spruce [Major]

Year	Remarks
1975	Populations increased for the second consecutive year and caused serious damage and some tree mortality in windbreaks along highways through the southern part of the district.
1976	Severe defoliation occurred in spruce windbreaks along highways and in plantations. Some tree mortality was evident.
1977	Large populations recurred and caused serious damage in spruce plantations and in windbreaks along highways. Because of repeated defoliation in windbreaks some tree mortality occurred.
1978-1980	Heavy infestations persisted in plantations and in highway windbreaks at several points in the district.

White Pine Weevil, *Pissodes strobi* (Peck)

Host(s): all pines, all spruces [Major]

Year	Remarks
1950-1955	not reported
1956	Trace populations were noted on jack pine, white spruce and black spruce at scattered locations.
1957	Heavy damage occurred in Sheraton Twp where quantitative sampling in black spruce and jack pine reproduction areas revealed an incidence of 21% and 7% leader damage, respectively. Small numbers were observed elsewhere.
1958	Populations declined in Sheraton Twp and at other points remained at much the same level as in the previous year.
1959	Only small numbers of weevil-damaged trees were noted.
1960	An incidence of 30% leader damage was recorded in a white spruce reproduction area in Whitney Twp. Small numbers were observed at scattered points elsewhere.

(cont'd)

White Pine Weevil, *Pissodes strobi* (Peck) (concl.)

Host(s): all pines, all spruces [Major]

Year	Remarks
1961	Populations declined by about 50% in Whitney Twp; elsewhere damage remained at much the same levels as in the previous year.
1962	Populations levels were comparable to those of the previous year.
1963	An incidence of 21% leader damage was noted in white spruce reproduction in Whitney Twp. Small numbers were commonly observed at a few scattered points elsewhere.
1964	Heavy damage recurred in Whitney Twp and in a Scots pine provenance test plot in German Twp. Populations declined elsewhere.
1965	A heavy infestation persisted in Whitney Twp and moderate damage was noted in Sheraton Twp. Light infestations were observed at many other points in the district.
1966	Infestations persisted in Whitney and Sheraton twps; elsewhere little change in population levels could be detected.
1967	Populations declined to a light intensity.
1968	A new medium infestation was discovered in a white pine plantation in Sheraton Twp. Elsewhere populations remained at a low level.
1969	Populations declined; only small numbers of weevil-damaged trees could be found.
1970-1977	Populations remained at a low level.
1978	A moderate infestation damaged 12% of the leaders in a jack pine plantation in Timmins Twp. Small populations were commonly observed at numerous points elsewhere.
1979-1980	Little change in population levels could be detected.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Host(s): tamarack [Major]

Year	Remarks
1950-1952	not reported
1953	Trace populations were observed in Wark, Murphy, Evelyn, Timmins, Keefer and Denton twps.
1954	Populations were observed at 11 points. Light-to-moderate defoliation was evident in Hillary Twp.
1955	Populations increased markedly and caused moderate-to-severe defoliation in many stands throughout the district.
1956-1959	Heavy infestations persisted at numerous points.
1960	Populations declined; however, light-to-moderate damage was evident at numerous points in the district.
1961	Populations declined for the second consecutive year to reach a low level.
1962	Little change in population levels over the previous year could be detected.
1963	The distribution of this sawfly declined; only a small number of stands was populated.
1964	Small numbers were observed at seven points.
1965-1966	Only trace populations could be found.
1967	A small pocket of light-to-medium infestation was recorded in Robb Twp. Scattered colonies were observed in four additional townships.
1968	Populations increased and caused moderate-to-severe defoliation on small numbers of trees in Sheraton, Robb and German twps. Small numbers were observed at scattered points elsewhere.
1969	A pocket of heavy infestation was noted in Sheraton Twp and light-to-moderate defoliation was evident at one point in Robb Twp.

(cont'd)

Larch Sawfly, *Pristiphora erichsonii* (Htg.) (concl.)

Host(s): tamarack [Major]

Year	Remarks
1970	A pocket of heavy infestation was observed in Robb Twp and light-to-moderate defoliation was evident in a plantation in Sheraton Twp.
1971	not reported
1972-1973	Trace populations were observed at scattered points.
1974-1975	not reported
1976-1980	Trace populations were observed.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)

Host(s): mountain ash [Major]

Year	Remarks
1950-1961	not reported
1962	The first record of this sawfly in the district was obtained when a medium infestation was encountered in Tisdale Twp. Small numbers of colonies were observed at a few points elsewhere.
1963	The infestation previously reported in Tisdale Twp declined to light intensity.
1964	Populations increased and caused light defoliation on host trees in urban areas.
1965	Light infestations were noted at eight scattered points.
1966	Populations increased to medium intensity and caused moderate-to-severe defoliation in the towns of Timmins and Schumacher. New infestations were recorded in Robb, Mountjoy and McKeown twps.
1967-1968	Little change in population levels could be detected.

(cont'd)

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.) (concl.)

Host(s): mountain-ash [Major]

Year	Remarks
1969-1970	Moderate-to-severe defoliation occurred in Keefer and Tisdale twps. Small numbers of sawflies were observed at several points elsewhere.
1971-1973	not reported
1974-1976	Small pockets of heavy infestation were observed at a few points.
1977	Small pockets of heavy infestation persisted, and because of repeated severe defoliation, considerable deterioration of host trees was evident.
1978-1980	Severe defoliation of host trees was general in the district, particularly in urban areas.

Ambermarked Birch Leafminer, *Profenusa thomsoni* (Konow)

Host(s): birch [Major]

Year	Remarks
1950-1954	not reported
1955	Small numbers were found in Tisdale Twp.
1956	Trace populations occurred at widely separated points.
1957	Heavy infestations were observed in Tisdale and Mountjoy twps.
1958	Heavy infestations persisted in Tisdale and Mountjoy twps and expanded into Whitney and Deloro twps. New medium infestations were found in Hillary and Timmins twps.
1959-1960	Little change in population levels could be detected.
1961	Populations increased. A heavy infestation recurred in Tisdale Twp and pockets of new heavy infestation were recorded in Evelyn, Cody and Timmins twps. Light-to-moderate leafmining was noted at three points elsewhere.

(cont'd)

Ambermarked Birch Leafminer, *Profenusa thomsoni* (Konow) (concl.)

Host(s): birch [Major]

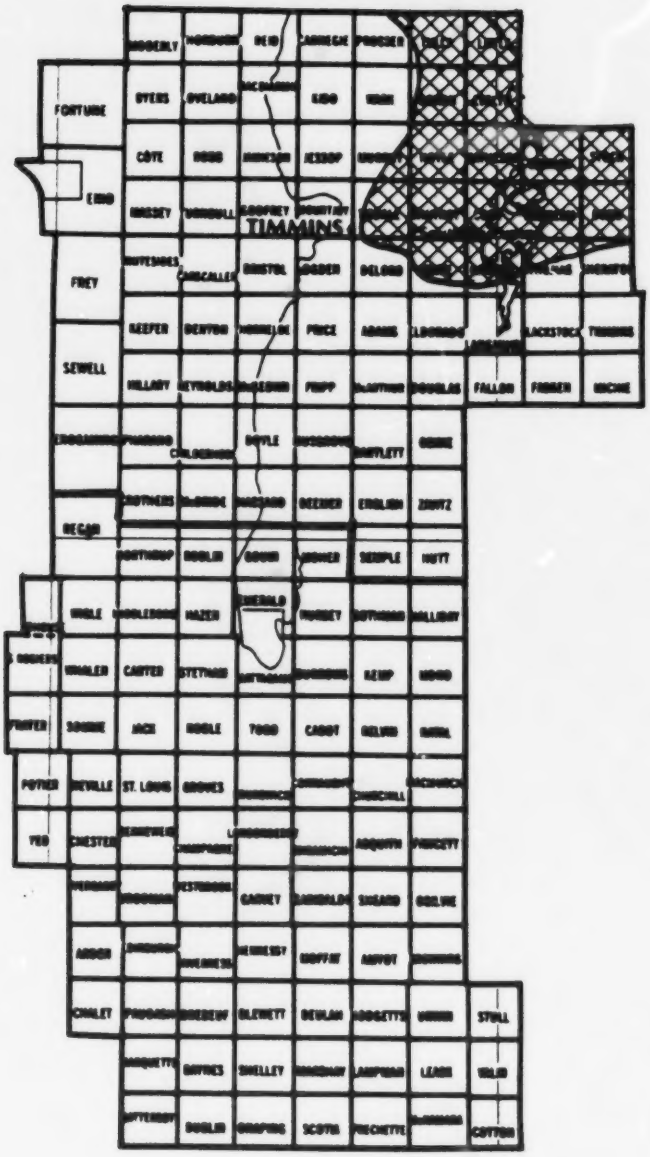
Year	Remarks
1962	Heavy infestations persisted in Tisdale, Evelyn and Timmins twps. Light-to-moderate damage was noted in Hillary Twp.
1963	Little change in population levels occurred. Heavy infestations persisted at several locations.
1964	Populations declined to light-to-medium intensity.
1965	Populations declined for the second consecutive year to reach a low level.
1966-1967	Low population levels persisted at several points in the district.
1968	Populations increased to heavy intensity in Tisdale, Hillary and Evelyn twps. Small populations persisted at scattered points elsewhere.
1969	Populations declined to moderate intensity in Tisdale, Hillary and Evelyn twps. Small populations were observed a few points elsewhere.
1970	Populations declined for the second consecutive year to reach a low level.
1971	Only trace populations could be found.
1972	Trace populations persisted.
1973-1974	not reported
1975	Small numbers were observed at scattered points.
1976	Populations increased and caused moderate damage in Macklem Twp. Small numbers were observed at other widely separated points.
1977-1978	Light leafmining was observed at numerous points in the district.
1979	Populations declined to a trace level in a few places.
1980	not reported

Aspen Leafroller, *Pseudexentera oregonana* Wlshm.

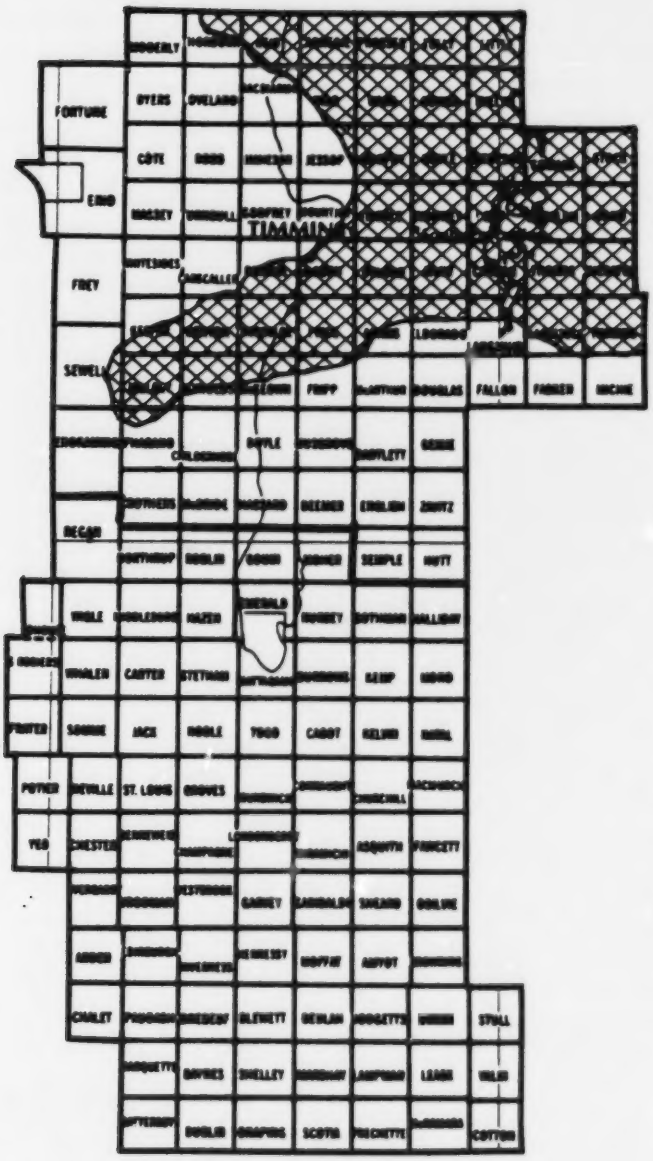
Host(s): poplar [Major]

Year	Remarks
1950-1964	not reported
1965	This insect was recorded for the first time in the district when small, light infestations were found in a few places.
1966	Small pockets of light infestation were observed in the southern part of the district.
1967	Populations decreased to a trace level.
1968-1969	Only small numbers could be found.
1970-1973	not reported
1974	Light defoliation occurred in Robb and Hassard twps.
1975	not reported
1976	Heavy infestations occurred in the northeastern part of the district (see map, page 69).
1977	Heavy infestations persisted and extended from the northeastern part of the district into the central part (see map, page 70).
1978	A marked decline occurred in the area of heavy infestation. Pockets of moderate-to-severe defoliation were evident in the South Porcupine area and in the northeastern corner of the district (see map, page 71).
1979	Populations continued to decline, leaving a small pocket of light defoliation in the vicinity of South Porcupine.
1980	not reported

TIMMINS AND GOGAMA DISTRICTS



TIMMINS AND GOGAMA DISTRICTS



ASPEN LEAFROLLER

Areas within which defoliation occurred in 1977

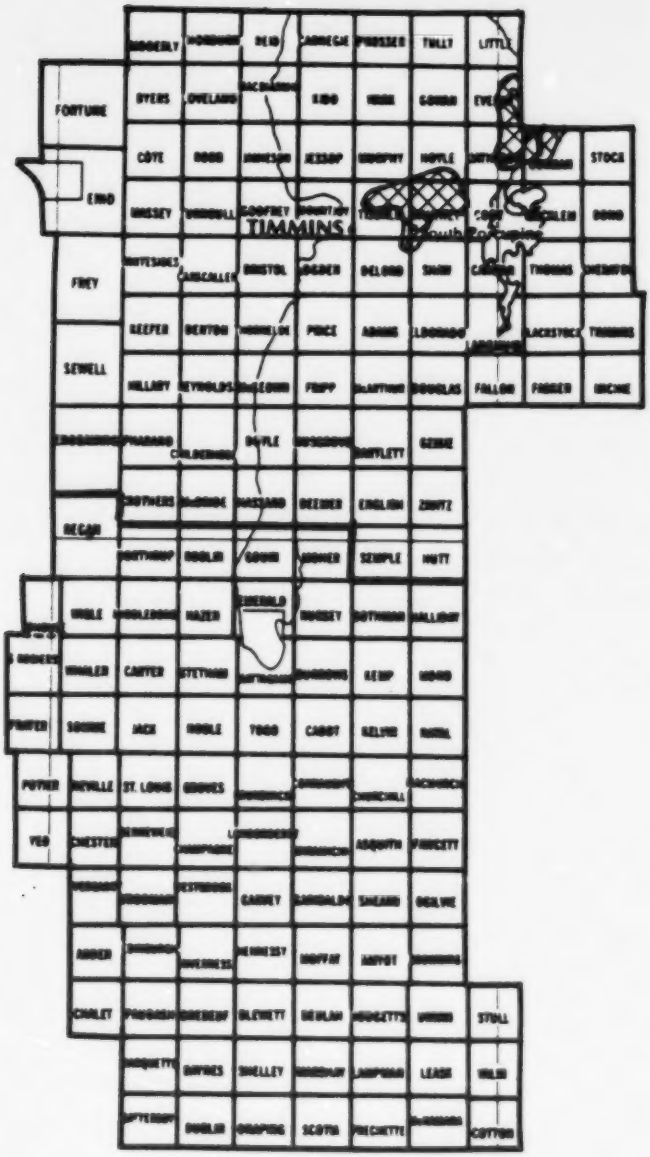
LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

TIMMINS AND GOGAMA DISTRICTS



ASPEN LEAFROLLER

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation

0 KM 40

SCALE

Pine Tortoise Scale, *Toumeyella parvicornis* (Ckll.)

Host(s): jP, scP [Major]

Year	Remarks
1950-1963	not reported
1964	Small populations were found on Scots pine trees in German Twp and on jack pine regeneration at one point in Robb Twp.
1965	Populations increased and caused heavy damage in a Scots pine plantation in German Twp. Light damage was encountered on scattered jack pine regeneration in Robb, Shaw and Denton twps.
1966-1967	Little change in population levels of this scale insect could be detected.
1968	not reported
1969	A heavy infestation recurred in the Scots pine plantation in which infestations were previously reported in German Twp.
1970-1973	not reported
1974-1976	Small groups of jack pine regeneration trees were heavily infested at a few scattered points.
1977	not reported
1978	Small numbers of jack pine regeneration trees were heavily infested at a few points.
1979-1980	not reported

Other Noteworthy Insects

Eastern Blackheaded Budworm, *Acleris variana* (Fern.)

Host(s): spruce, bF [Major]

Year	Remarks
1950-1951	Trace populations were found at a few scattered points.
1952-1956	not reported
1957	Small numbers of larvae were observed.
1958	not reported
1959	Only small numbers were found.
1960	not reported
1961	Light infestations occurred in Hillary, Keefer, German, Tisdale and Evelyn twps.
1962	Populations decreased to a low level throughout the district.
1963-1968	Populations remained at a low level.
1969	not reported
1970-1972	Only small numbers of larvae could be found.
1973-1980	not reported

Pine Spittlebug, *Aphrophora cribrata* (Wlk.)

Host(s): conifers [Major]

Year	Remarks
1950-1959	not reported
1960	A light infestation occurred on jack pine and balsam fir trees in Tisdale Twp. Small numbers of the insect were common on a variety of hosts at several other points in the district.
1961	not reported

(cont'd)

Pine Spittlebug, *Aphrophora cribrata* (Wlk.) (concl.)

Host(s): conifers [Major]

Year	Remarks
1962	A light infestation was noted on open-grown jack pine trees at one point in Tisdale Twp.
1963	Little change in population levels occurred.
1964-1965	not reported
1966	Small numbers were observed at several points.
1967	A light infestation occurred in German Twp.
1968-1974	not reported
1975-1978	Trace populations were widespread throughout the district.
1979	An increase in population levels was evident at numerous points.
1980	not reported

Larch Casebearer, *Coleophora laricella* (Hbn.)

Host(s): larch [Major]

Year	Remarks
1950-1959	not reported
1960	first record in district; small numbers found in Whitney Twp
1961-1966	not reported
1967-1968	Small numbers were found in Mountjoy Twp.
1969	Trace populations were recorded in Mountjoy and Carscallen twps.
1970-1973	not reported
1974-1977	Small populations were observed in Keefer and McKeown twps.
1978-1980	not reported

Jack Pine Tip Beetle, *Conophthorus banksianae* McP.

Host(s): JP [Minor]

Year	Remarks
1950-1955	not reported
1956	Light tip damage occurred in Keefer and McArthur twps.
1957	not reported
1958	Small numbers were observed at scattered points.
1959-1961	not reported
1962	A light infestation occurred in McKeown Twp and small numbers were observed at numerous points elsewhere.
1963	not reported
1964-1966	Light infestations occurred on open-grown jack pine trees at several points.
1967	A general decline in populations was evident, except in Robb Twp, where a light infestation was recorded.
1968	Populations increased and caused light damage in Sheraton and Tisdale twps; a light infestation persisted in Robb Twp.
1969-1974	not reported
1975-1980	Light infestations were noted at numerous points in the district.

Yellownecked Caterpillar, *Datana ministra* (Dru.)

Host(s): deciduous [Minor]

Year	Remarks
1950-1956	not reported
1957	A heavy infestation caused approximately 50% defoliation on a small group of white birch trees in Evelyn Twp.
1958	Small numbers were observed at one point.

(cont'd)

Yellownecked Caterpillar, *Datana ministra* (Dru.) (concl.)

Host(s): deciduous [Minor]

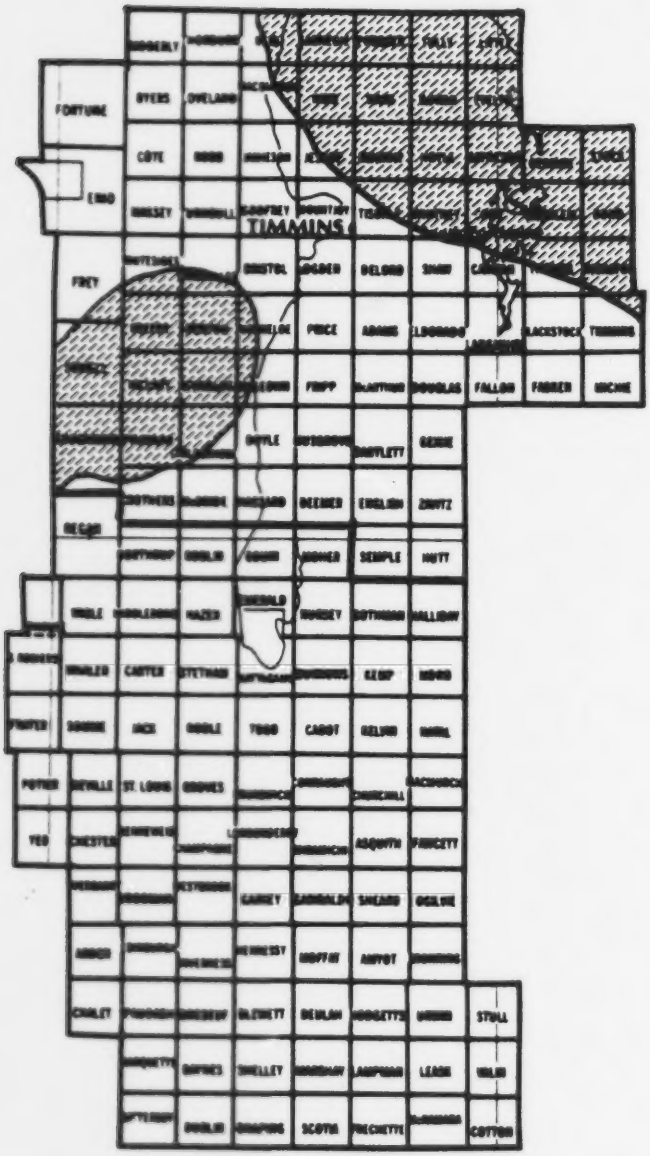
Year	Remarks
1959-1962	not reported
1963	Small numbers of colonies occurred in Macklem Twp.
1964-1966	not reported
1967	A trace population was encountered in Mountjoy Twp.
1968	Small numbers of colonies were observed in Whitney Twp.
1969-1980	not reported

Eastern Larch Beetle, *Dendroctonus simplex* LeC.

Host(s): tamarack [Minor]

Year	Remarks
1950-1960	not reported
1961	Populations of this beetle were found consistently in decadent larch stands at several locations in the district.
1962	High populations persisted and considerable tree mortality occurred (see map, page 77).
1963	Populations declined to a trace level at scattered locations.
1964-1980	not reported

TIMMINS AND GOGAMA DISTRICTS



EASTERN LARCH BEETLE

Areas within which tree mortality occurred in 1962

LEGEND

Mortality

0 KM 40

SCALE

Aspen Twoleaf Tier, *Enargia decolor* (Wlk.)

Host(s): poplar [Major]

Year	Remarks
1950-1959	not reported
1960-1961	A trace population was reported.
1962-1963	not reported
1964	A trace population was observed.
1965-1967	not reported
1968-1969	Small numbers were commonly observed in conjunction with other poplar defoliators.
1970	Populations increased and caused moderate-to-severe defoliation in the southwestern part of the district (see map, page 79).
1971-1977	not reported
1978	small numbers observed at several points in the district
1979	Populations increased slightly and were widespread through the district.
1980	not reported

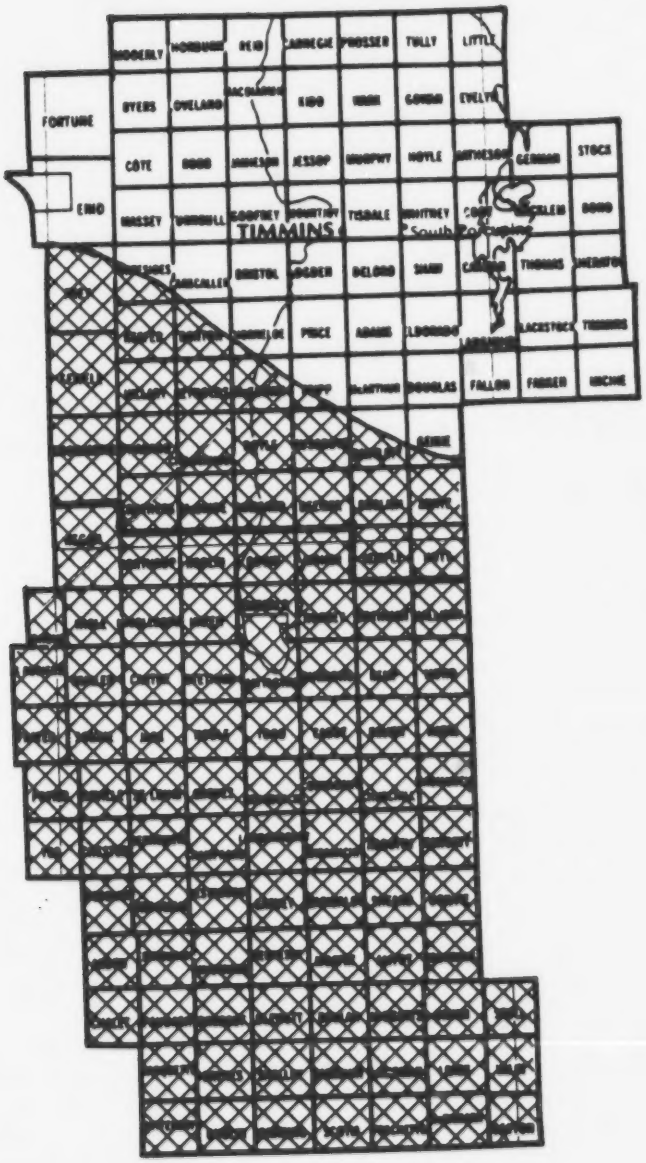
European Spruce Sawfly, *Gilpinia hercyniae* (Htg.)

Host(s): spruce [Minor]

Year	Remarks
1950-1956	not reported
1957	Trace populations occurred at a few points.
1958	not reported
1959-1967	Small numbers were found at widely separated points.
1968	not reported

(cont'd)

TIMMINS AND GOGAMA DISTRICTS



ASPEN TWOLEAF TIER
(Enargia decolor)
Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation

0 KM 40
SCALE

European Spruce Sawfly, *Gilpinia hercyniae* (Htg.) (concl.)

Host(s): spruce [Minor]

Year	Remarks
1969-1970	Trace populations were observed at a few points.
1971-1972	not reported
1973	Trace populations occurred at widely separated points.
1974-1980	not reported

Northern Pitch Twig Moth, *Petrova albicapitana* (Busck)

Host(s): jP [Minor]

Year	Remarks
1950-1954	not reported
1955	Trace populations were observed at two points.
1956-1957	Small numbers were observed on immature jack pine trees at numerous points.
1958-1959	not reported
1960	Trace populations were observed in a few places.
1961-1962	not reported
1963	Light damage was noted at several points in the district.
1964-1966	not reported
1967-1968	Light damage occurred in plantations in Sheraton and Timmins twps.
1969-1970	not reported
1971-1974	Trace populations occurred in a few places.
1975	high numbers in Robb and Thorneloe twps
1976	light damage throughout the district

(cont'd)

Northern Pitch Twig Moth, *Petrova albicapitana* (Busck) (concl.)

Host(s): jP [Minor]

Year	Remarks
1977	High populations were recorded in Robb and Thorneloe twps; small numbers were common at numerous points elsewhere.
1978	Populations declined to a trace level.
1979	Small numbers were commonly observed.
1980	commonly observed at low levels at numerous points.

Spruce Bud Midge, *Rhabdophaga swainei* Felt

Host(s): spruce [Minor]

Year	Remarks
1950-1959	not reported
1960	The first record of this insect in the district was obtained when small numbers were found in Timmins and Matheson twps.
1961	Small numbers persisted in Timmins and Matheson twps.
1962-1963	Small populations were observed in Timmins, Matheson and Denton twps.
1964	not reported
1965	A trace population was reported in Matheson Twp.
1966	Populations increased and caused light damage in Timmins and Denton twps.
1967	Light damage recurred in Timmins and Denton twps.
1968	Little change in population levels could be detected.
1969-1971	not reported
1972-1974	Trace populations were observed at a few points.
1975-1980	not reported

DISEASES

Armillaria Root Rot, *Armillaria mellea* (Vahl:Fr.) Kummer

Host(s): all species [Major]

Year	Remarks
1950-1962	not reported
1963	A high incidence of infection was noted in black spruce reproduction in Timmins and Sheraton twps. Light infection was also noted in red pine reproduction areas in the above townships.
1964	not reported
1965	Light levels of infection were observed at several locations.
1966	Some mortality occurred in plantations and natural stands in Sheraton, Thomas, Adams and German twps.
1967	Light tree mortality was recorded in jack pine plantations in Timmins and Sheraton twps.
1968	Trace levels of infection were encountered at numerous locations.
1969	A moderate level of damage occurred in Sheraton Twp.
1970-1972	not reported
1973	The incidence of mortality ranged up to 10% in jack pine plantations in Sheraton Twp.
1974-1976	Light levels of infection were evident in jack pine reproduction through the district.
1977-1978	Small numbers of infected trees were commonly observed in spruce and pine plantations through the district.
1979-1980	not reported

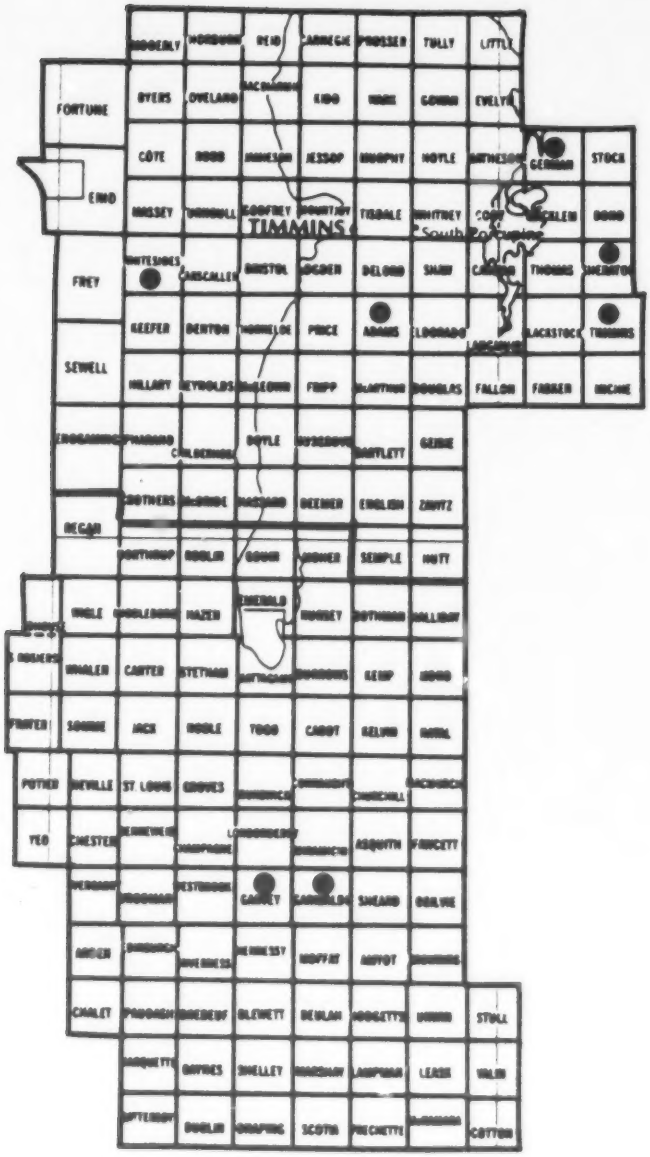
Scleroderris Canker, *Ascocalyx abietina* (Lagerb.) Schläpfer-Bernhard

Host(s): pine

[Major]

Year	Remarks
1950-1965	not reported
1966	Infection centers were discovered in Sheraton, Adams, Timmins, Whitesides and German twps. Severe damage was evident in each area (see map, page 87)
1967	Severe damage continued to occur in Sheraton, Adams, Timmins, Whitesides and German twps (see map, page 88).
1968	Severe damage occurred in red pine plantations in Adams and German twps.
1969	A high incidence of infection was recorded in Timmins, Sheraton, Whitesides and German twps.
1970	Levels of infection decreased to light intensity in Sheraton, Whitesides and German twps.
1971	An increase in infection levels was responsible for serious damage in jack pine plantations in Sheraton, Timmins, Macklem and German twps.
1972	Infection levels declined to moderate intensity in Sheraton, Timmins, Macklem and German twps.
1973-1975	No change in levels of infection could be detected.
1976-1978	not reported
1979	Light infection occurred in many plantations in the district.
1980	An increase in the level of infection was responsible for moderate damage in German Twp. Light damage was noted in Macklem and Sheraton twps.

TIMMINS AND GOGAMA DISTRICTS



SCLERODERRIS CANKER

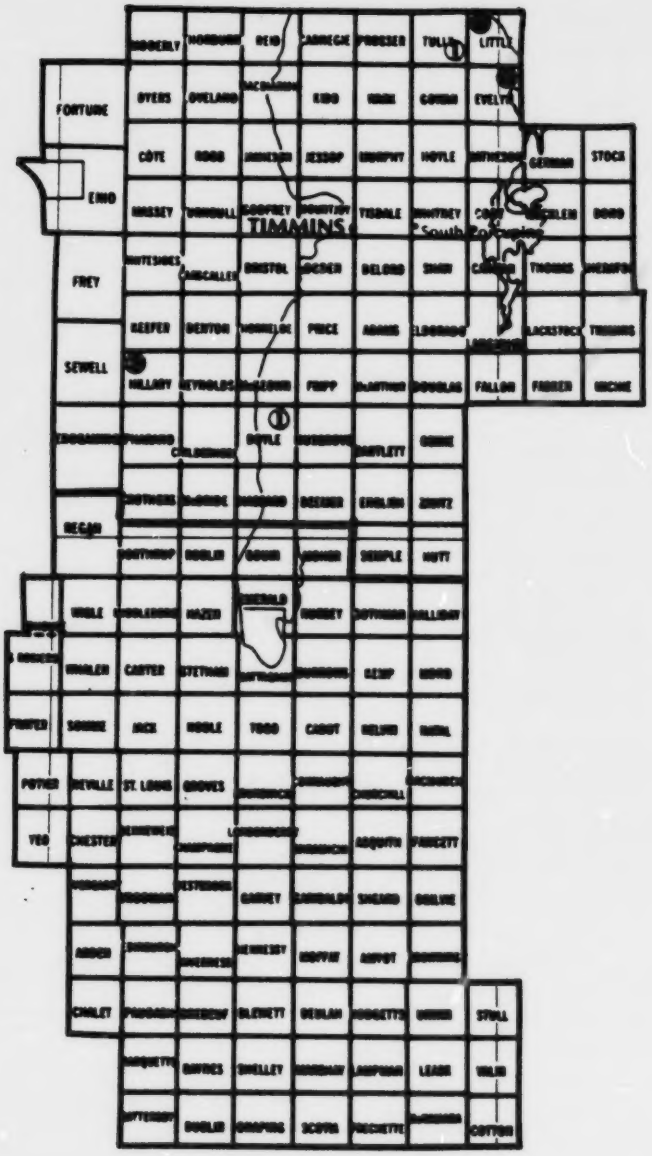
Locations where infections occurred in 1966

LEGEND

Moderate-to-severe infection ●

0 KM 40
SCALE

TIMMINS AND GOGAMA DISTRICTS



SCLERODERRIS CANKER

Locations where infections were observed in 1967

LEGEND

Single record ◐

Multiple records ●

0 KM 40

SCALE

Spruce Needle Rusts, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary and *C. ledicola* (Peck) Lagerh.

Host(s): spruce [Major]

Year	Remarks
1950-1954	not reported
1955	Low levels of infection were observed at numerous points.
1956	not reported
1957-1958	Trace levels of infection occurred at several points.
1959-1962	not reported
1963	Light damage was evident at many points in the district.
1964-1966	not reported
1967	Low levels of infection were common throughout the district.
1968	Moderate damage occurred in Deloro Twp and trace infection was encountered at numerous points elsewhere.
1969	Low levels of infection were commonly observed.
1970-1971	not reported
1972	Moderate-to-heavy damage was found in Michie Twp.
1973-1975	not reported
1976-1977	Low levels of infection were observed at numerous points.
1978	not reported
1979-1980	Only trace levels of infection could be found.

Ink Spot of Aspen, *Ciborinia whetzelii* (Seaver) Seaver

Host(s): tA [Major]

Year	Remarks
1950-1958	not reported
1959-1960	Light damage occurred at several points.
1961-1964	not reported
1965	High levels of infection were encountered at several locations.
1966	not reported
1967	A high level of infection was observed in Timmins Twp.
1968	not reported
1969	High levels of infection were recorded at seven scattered locations.
1970	Moderate-to-heavy damage occurred in the Kamiskotia and Night Hawk lakes areas.
1971-1972	Infection declined to a trace level through the district.
1973	High levels of infection were noted in German and English twps.
1974	Moderate levels of infection were encountered at numerous points in the district.
1975	Light damage was evident through most of the district.
1976-1977	not reported
1978	An area of light damage was observed in Shaw Twp.
1979	An increase in the level of infection and distribution was responsible for moderate-to-severe damage in Robb and Denton twps. A pocket of light damage was found in McBride Twp as well.
1980	Only trace levels of infection could be found.

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur

Host(s): jP,scP [Major]

Year	Remarks
1950-1954	not reported
1955	Light infection was noted in Thorneloe and Murphy twps.
1956-1957	not reported
1958	Low infection levels persisted in Thorneloe Twp.
1959-1960	not reported
1961	A high incidence of infection was found in Tisdale and Murphy twps. Disease evaluations revealed an incidence of 24% and 35%, respectively, in the above areas.
1962	not reported
1963	Moderate-to-heavy damage was recorded in Tisdale, Mountjoy and Murphy twps. Light tree mortality was evident in Murphy Twp.
1964	Moderate-to-heavy damage continued.
1965	A high incidence of infection was noted at several points.
1966	New areas of heavy infection were found in Keefer and Timmins twps.
1967	Heavy infection continued at many points.
1968	New areas of heavy infection were found in Sheraton and Timmins twps.
1969	No change in area of infection could be detected.
1970-1972	Heavy infection persisted in Sheraton and Timmins twps.
1973	High levels of infection persisted in Sheraton Twp. Moderate damage was evident in Whitney, German and Mountjoy twps.
1974	not reported
1975	Moderate damage occurred in Murphy Twp.
1976-1979	No change in the status of this disease could be detected.
1980	not reported

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer

Host(s): wP [Major]

Year	Remarks
1950-1961	not reported
1962	Small numbers of infected trees were found in Keefer Twp.
1963	Light damage recurred in Keefer Twp and a new infection center was discovered in McArthur Twp.
1964	A new infection center was found in Sheraton Twp; light damage was evident.
1965	Light damage was recorded in Sheraton and McArthur twps.
1966	Light damage recurred in McArthur Twp.
1967	Low levels of infection were evident in McArthur, Whitesides, Musgrove and Bartlett twps.
1968-1969	Little change in the status of this pathogen could be detected; light levels of infection persisted.
1970	Light tree mortality occurred in Sheraton Twp. Elsewhere little change in the status of the disease could be detected.
1971-1980	not reported

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats.

Host(s): jP, scP [Major]

Year	Remarks
1950-1968	not reported
1969-1970	A moderate level of infection occurred in McArthur Twp and low levels were noted in Sheraton and Timmins twps.
1971	A moderate level of infection persisted in McArthur Twp.
1972	Light damage occurred in a new infection center in Macklem Twp.

(cont'd)

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats. (concl.)

Host(s): jP, scP [Major]

Year	Remarks
1973	Light damage recurred in Macklem Twp and moderate damage was recorded in a newly discovered infection center in Adams Twp.
1974	Low levels of infection were observed in numerous jack pine reproduction areas.
1975-1977	not reported
1978	Low levels of infection were encountered in jack pine reproduction areas in Thorneloe Twp.
1979	not reported
1980	Low levels of infection were observed at several points.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller

Host(s): aspen [Major]

Year	Remarks
1950-1952	not reported
1953	Low infection levels were observed in aspen stands in Tisdale, Shaw and Musgrove twps.
1954	Continuing surveys revealed that this pathogen was widely distributed through the district.
1955	A quantitative sample in Evelyn Twp revealed an incidence of 1% infection in the area.
1956-1959	not reported
1960	Low levels of infection were encountered at numerous points in the district.
1961	not reported

(cont'd)

Hypoxylon Canker, *Hypoxylon mammatum* (Wahlenb.) J. Miller (concl.)

Year	Remarks
1962-1963	Extensive damage was evident and some tree mortality occurred in many stands.
1964	A high incidence of infection was noted in Tisdale Twp.
1965-1967	Little change in the level of infection could be detected.
1968	A quantitative sample in Tisdale Twp revealed an infection in one stand.
1969-1970	Little change in the level of infection could be detected.
1971	not reported
1972	Little change in the level of infection could be detected.
1973	A high level of infection was noted in Robb Twp and moderate damage was evident in Ogden and Tisdale twps.
1974-1980	No change in the status of this pathogen could be detected. Varying degrees of damage were evident throughout the district.

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx

Host(s): tA [Major]

Year	Remarks
1950-1959	not reported
1960	Low infection levels were observed at numerous points in the district.
1961-1963	not reported
1964	Moderate shoot mortality was encountered at many locations.
1965	Severe damage was recorded in Robb Twp.
1966	not reported
1967	A high incidence of infection caused severe damage in Loveland and Robb twps.

(cont'd)

Shoot Blight, *Venturia macularis* (Fr.) E. Müller & v. Arx (concl.)

Host(s): tA [Major]

Year	Remarks
1968	A marked decrease in the level of infection occurred. Only trace damage could be found.
1969	An increase in the level of infection was responsible for severe shoot mortality in Robb Twp.
1970	Varying degrees of damage were evident throughout the district.
1971-1976	not reported
1977	Light shoot mortality was observed at numerous locations.
1978	An increase in the level of infection was evident when heavy damage was found in Little and Evelyn twps and light damage occurred in Robb Twp.
1979	Moderate-to-heavy damage was encountered in Robb, Hillary and Denton twps.
1980	not reported

Other Noteworthy Diseases

Tar Spot Needle Cast, *Davisomycella ampla* (J. Davis) Darker

Host(s): jP [Minor]

Year	Remarks
1950-1959	not reported
1960	Low levels of damage were observed at numerous locations.
1961-1962	not reported
1963	Light-to-moderate damage was noted at many points in the district.
1964	not reported
1965	Light damage was noted in Tisdale Twp.

(cont'd)

Tar Spot Needle Cast, *Davisomycella ampla* (J. Davis) Darker (concl.)

Host(s): jP [Minor]

Year	Remarks
1966	An increase in the incidence of this pathogen was responsible for light damage at many points.
1967-1968	A decrease in the incidence of this pathogen was evident when only one lightly infected stand could be found.
1969-1975	not reported
1976-1977	Trace levels of infection were observed at numerous points.
1978	A pocket of heavy damage was noted in Little Twp.
1979	not reported
1980	Low infection levels were observed at many points in the district.

Larch-Poplar Rust, *Melampsora medusae* Thüm.

Host(s): tL, aspen [Major]

Year	Remarks
1950-1966	not reported
1967	A pocket of heavy infection was found in Sheraton Twp and light damage was evident in Mountjoy Twp.
1968	Infection declined to a low level in Sheraton Twp and light damage persisted in Mountjoy Twp.
1969	Trace levels of infection were noted in Mountjoy and Hassard twps.
1970-1980	not reported

ABIOTIC DAMAGE

Frost

Year	Remarks
1950-1963	not reported
1964	Heavy frosts in May and June caused severe damage to current growth on conifers of several species.
1965	not reported
1966	Late spring frosts caused light damage to current shoots of balsam fir in Godfrey and Hillary twps.
1967	not reported
1968	Severe damage was evident in a 200-ha area of jack pine.
1969	not reported
1970	Severe damage was evident on trees of many species throughout the district.
1971	not reported
1972	Varying degrees of current shoot mortality were evident on balsam fir at numerous points through the district.
1973-1976	not reported
1977	damage widespread and variable on aspen
1978	Varying degrees of damage were noted in Little Twp.
1979	not reported
1980	severe damage from frost and snow to trees of several species in the eastern half of the district

Snow

Year	Remarks
1950-1979	not reported
1980	severe damage to trees of several species in the eastern half of the district

Hail

Year	Remarks
1950-1962	not reported
1963	Severe damage occurred in German Twp.
1964-1980	not reported

APPENDICES

APPENDIX A

DECIDUOUS HOST

Common Name	Scientific Name	Abbreviations
Alder	*Alnus* spp.	Al
Apple	*Malus* spp.	Ap
Ash, black	*Fraxinus nigra* Marsh.	As
Aspen, largetooth	*Populus grandidentata* Michx.	lA
trembling	*tremuloides* Michx.	tA
Basswood	*Tilia* spp.	Ba
Beech	*Fagus grandifolia* Ehrh.	Be
Birch, white	*Betula papyrifera* Marsh.	wB
yellow	*alleghaniensis* Britt.	yB
Butternut	*Juglans cinerea* L.	Bu
Cherry, eastern choke	*Prunus virginiana* L.	eaCH
pin	*pensylvanica* L.f.	pCh
Elm, white	*Ulmus americana* L.	wE
Horse-chestnut	*Aesculus hippocastanum* L.	hChe
Ironwood	*Ostrya* spp.	I
Maple, Manitoba	*Acer negundo* L.	mM
red	*rubrum* L.	rM
sugar	*saccharum* Marsh.	sM
Mountain-ash, American	*Sorbus americana* Marsh.	aMo
Oak, bur	*Quercus macrocarpa* Michx.	bO
red	*rubra* L.	rO
Poplar, balsam	*Populus balsamifera* L.	bPo
Carolina	X *canadensis* Moench	cPo
Lombardy	*nigra* var. *italica* Muenchh.	lPo
silver	*alba* L.	sPo
Willow	*Salix* spp.	W

APPENDIX B

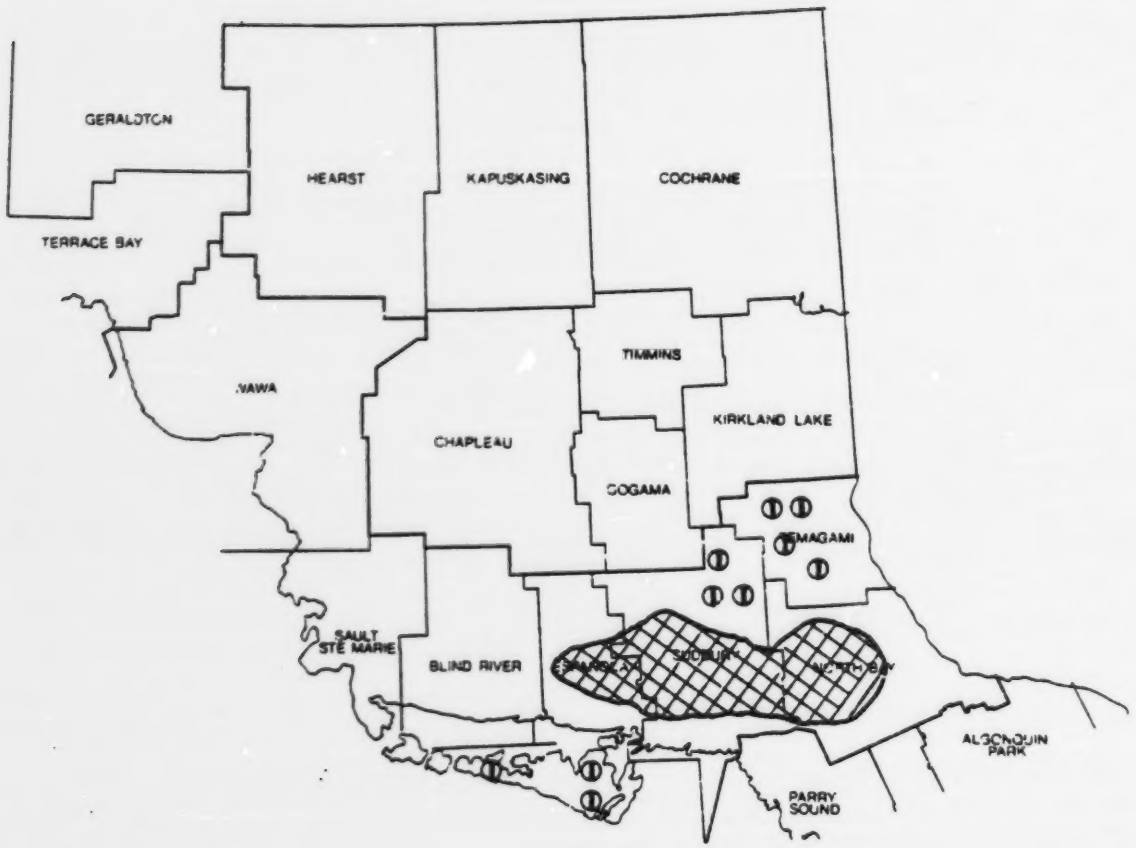
CONIFEROUS HOST

Common Name	Scientific Name	Abbreviations
Cedar, eastern white	*Thuja occidentalis* L.	eC
Fir, balsam	*Abies balsamea* (L.) Mill.	bF
Larch	*Larix laricina* (Du Roi) K. Koch	tL
Pine, Austrian	*Pinus nigra* Arn.	aP
eastern white	*strobus* L.	wP
jack	*banksiana* Lamb.	jP
mugho	*mugo* Turra var. *mughus* Zenari	mP
red	*resinosa* Ait.	rP
Scots	*sylvestris* L.	scP
Spruce, black	*Picea mariana* (Mill.) B.S.P.	bS
Colorado	*pungens* Engelm.	colS
Norway	*abies* (L.) Karst.	nS
red	*rubens* Sarg.	rS
white	*glauca* (Moench) Voss	wS

APPENDIX C

MAPS - NORTHEASTERN ONTARIO

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Birch Skeletonizer

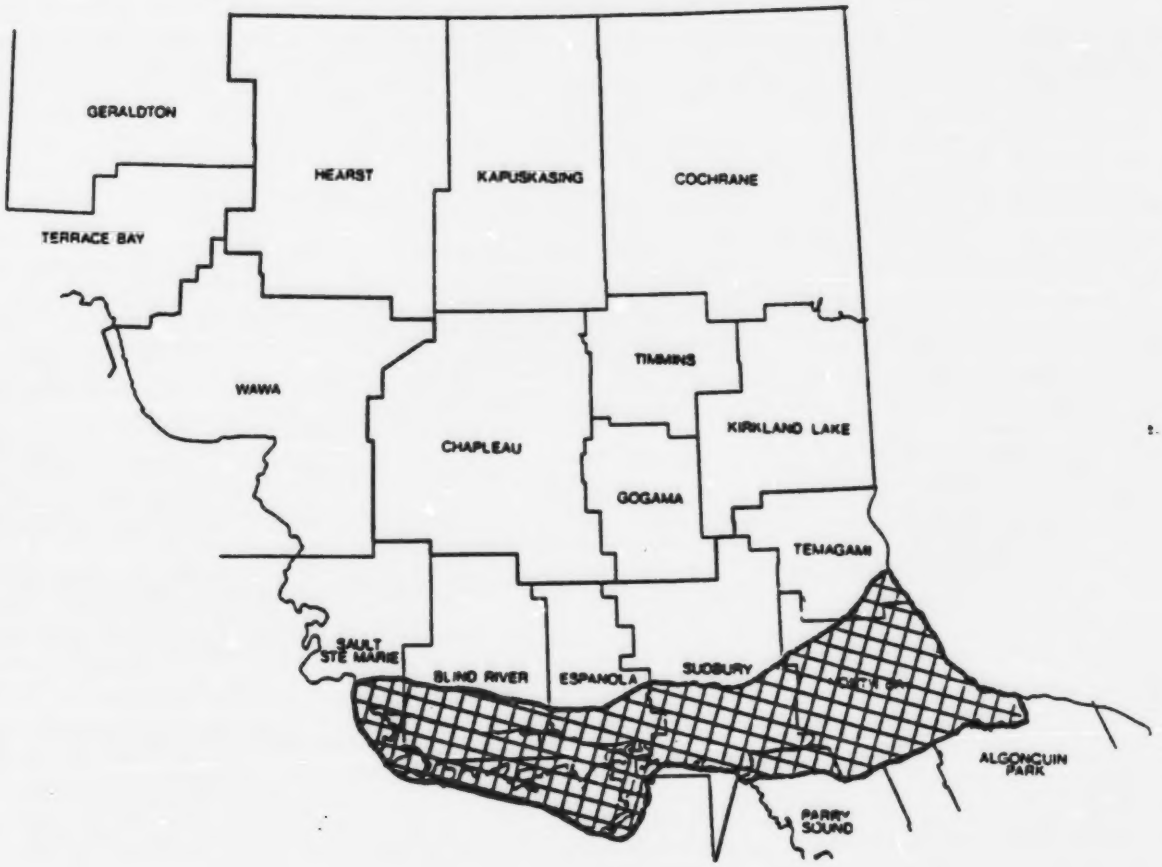
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO



Birch Skeletonizer

Areas within which defoliation occurred in 1961

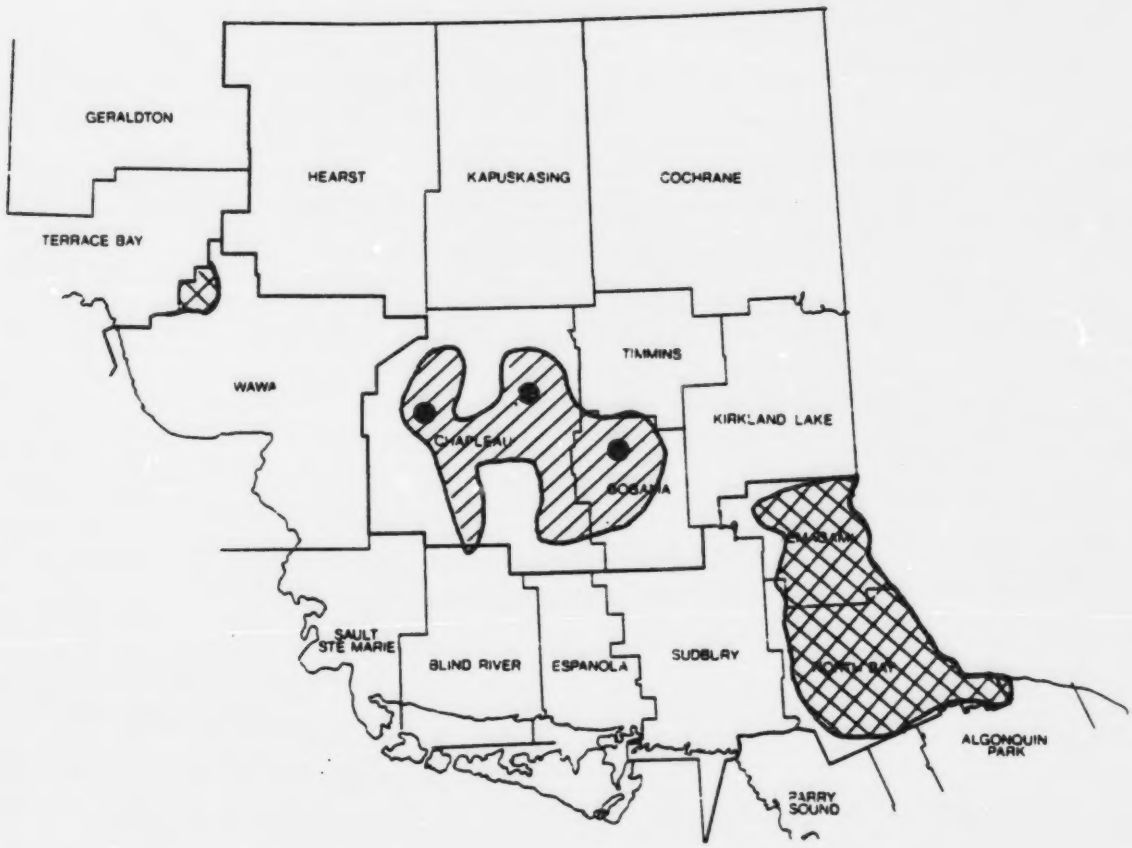
LEGEND

Moderate-to-severe defoliation

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Birch Skeletonizer

Areas within which defoliation occurred in 1963

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO

Birch Skeletonizer

Areas within which defoliation occurred in 1970

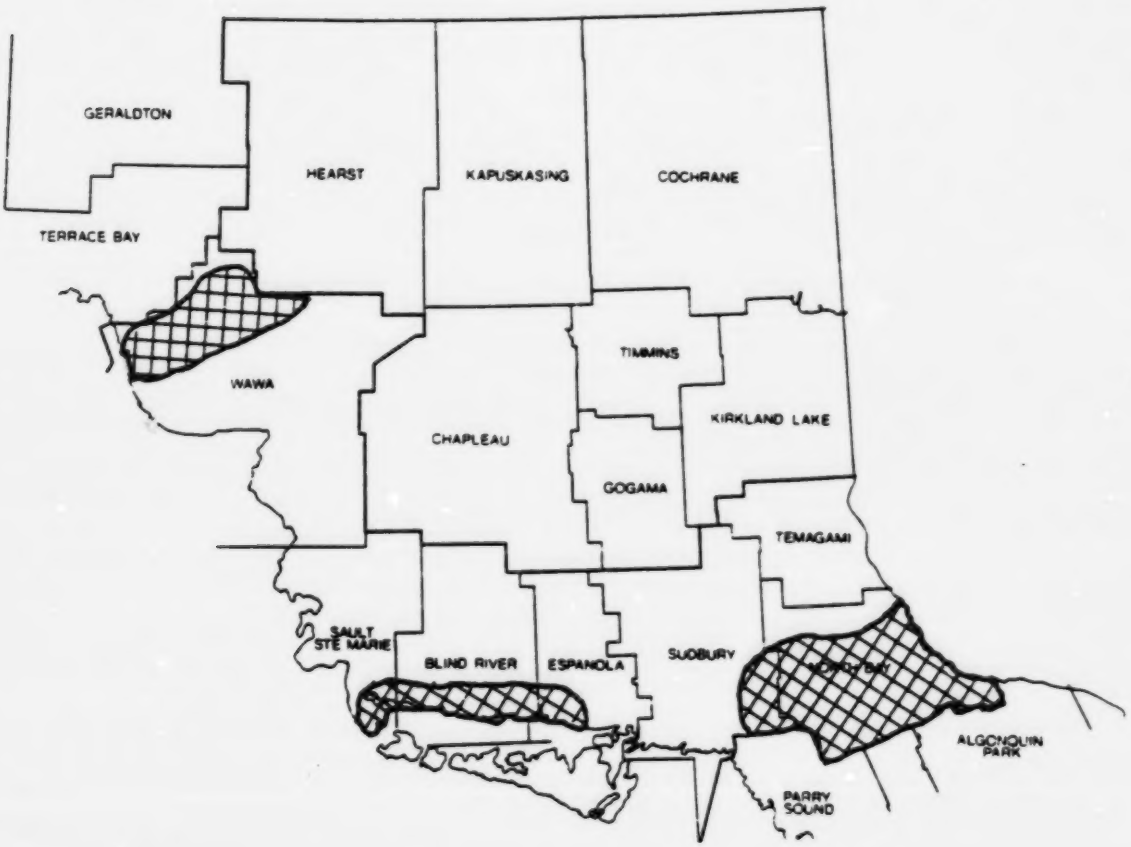
0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Birch Skeletonizer

Areas within which defoliation occurred in 1971

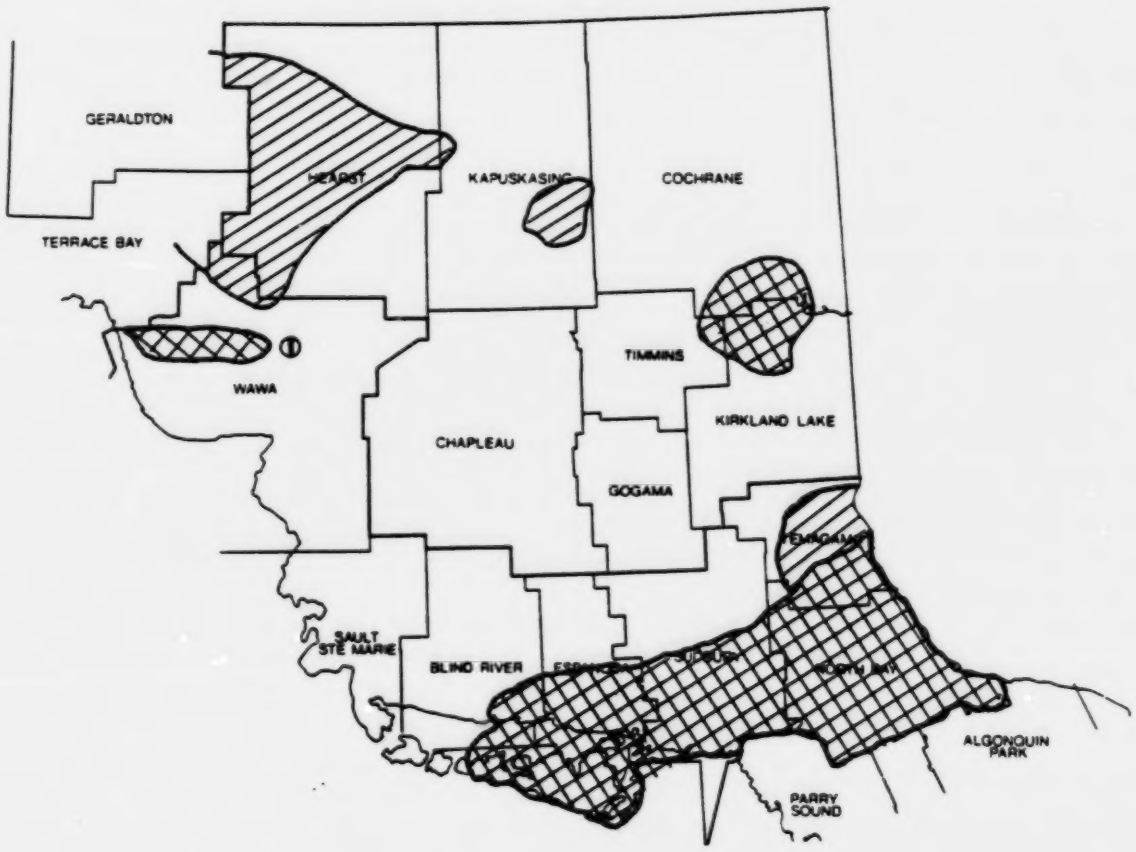
0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO



Birch Skeletonizer

Areas within which defoliation occurred in 1972

0 Miles 60

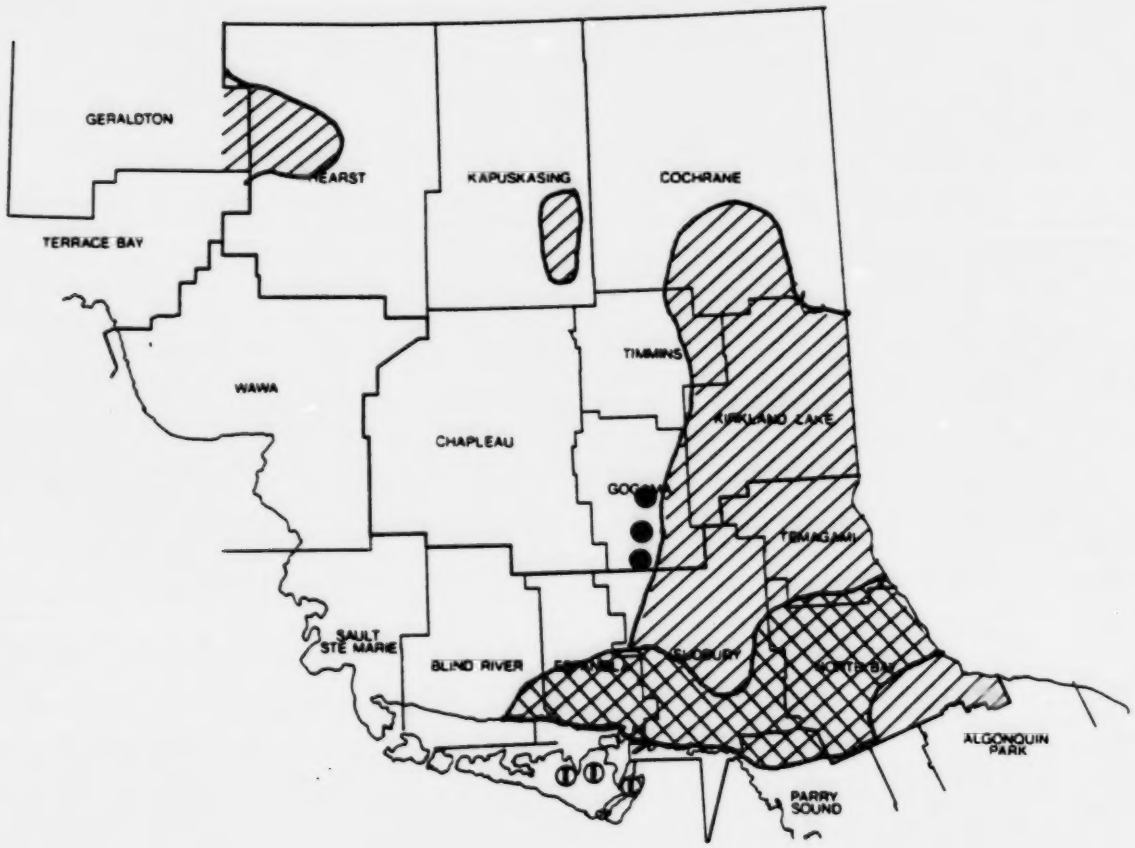
0 Kilometres 96

LEGEND

Light defoliation ① or

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO



Birch Skeletonizer

Areas within which defoliation occurred in 1973

0 Miles 60

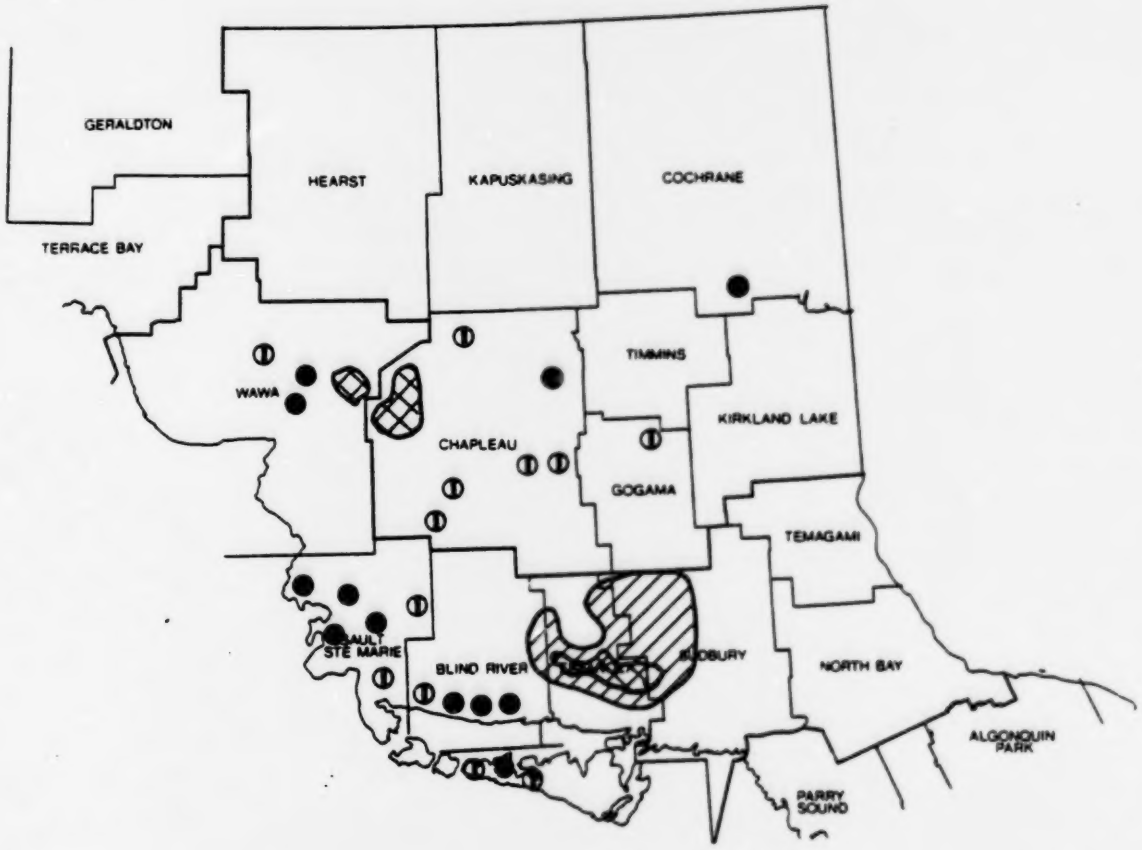
0 Kilometres 96

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHEASTERN ONTARIO



Large Aspen Tortrix

Areas within which defoliation occurred in 1957

0 Miles 60

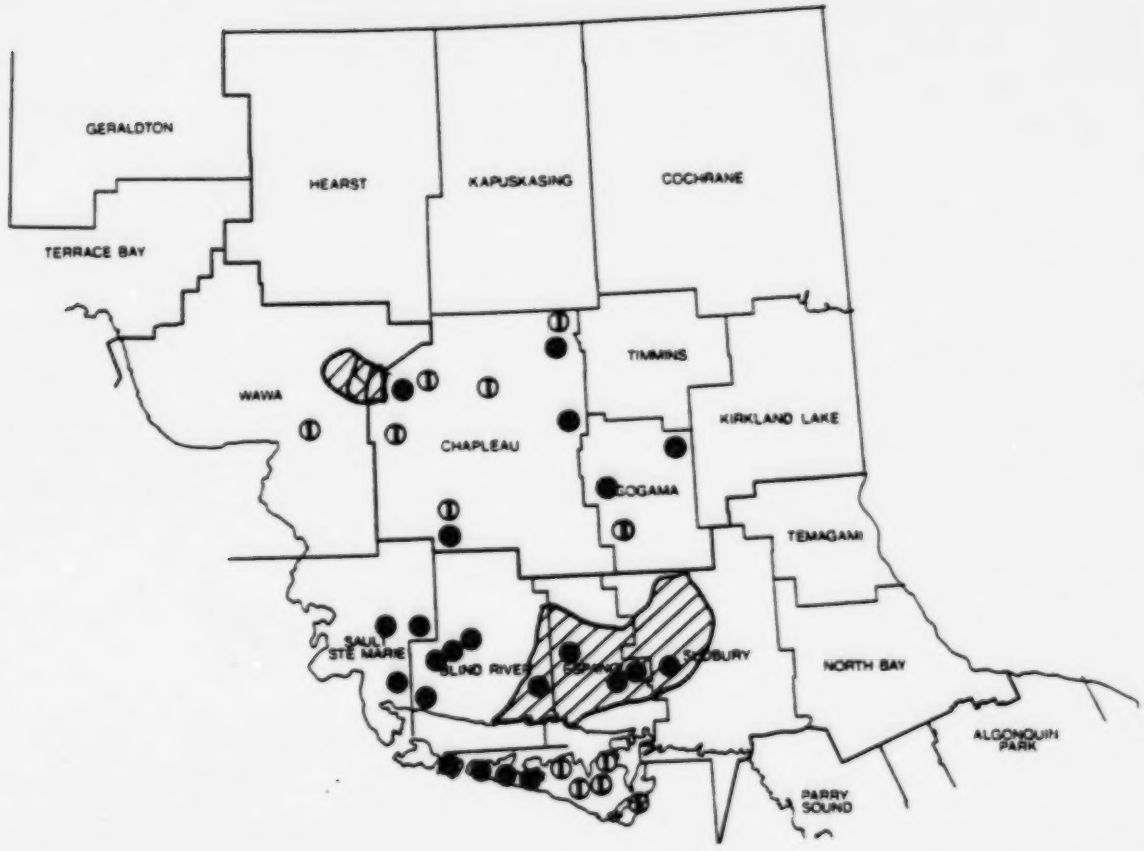
0 Kilometres 96

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHEASTERN ONTARIO



Large Aspen Tortrix

Areas within which defoliation occurred in 1958

0 Miles 60

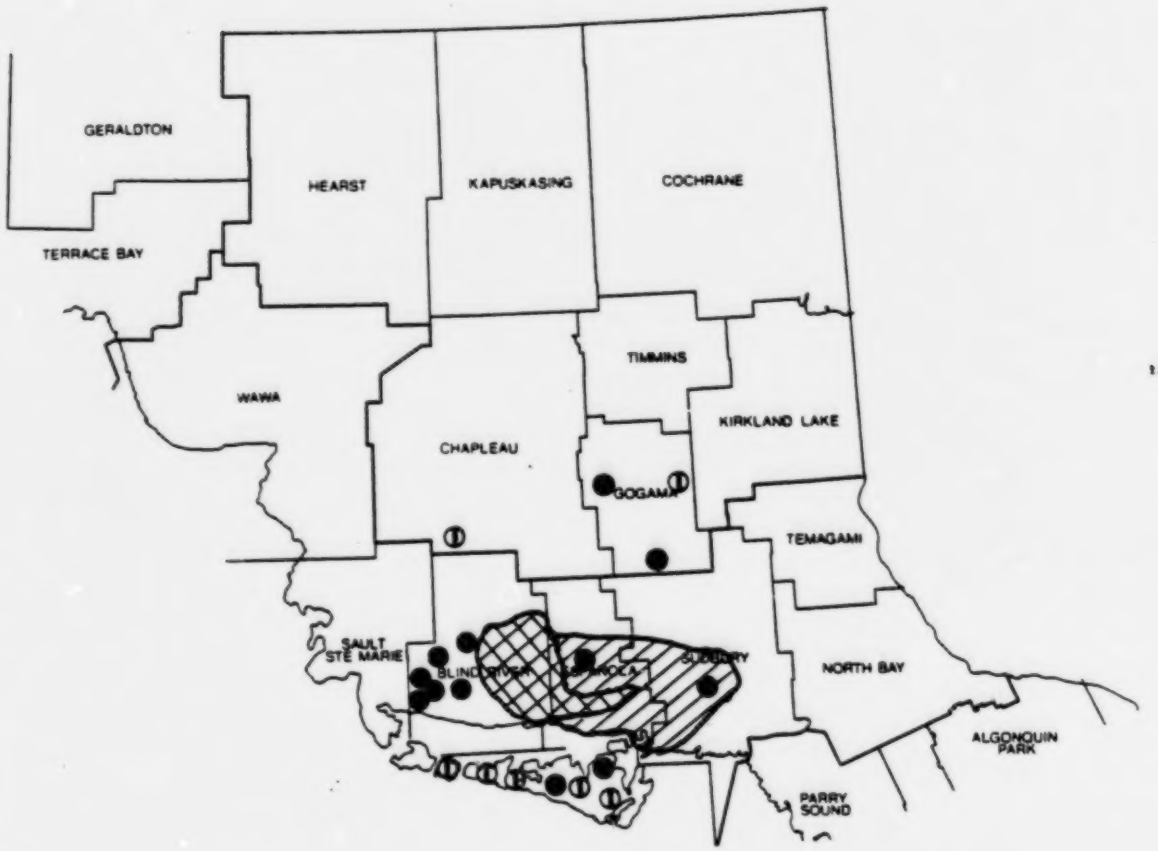
0 Kilometres 96

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Large Aspen Tortrix

Areas within which defoliation occurred in 1959

0 Miles 60

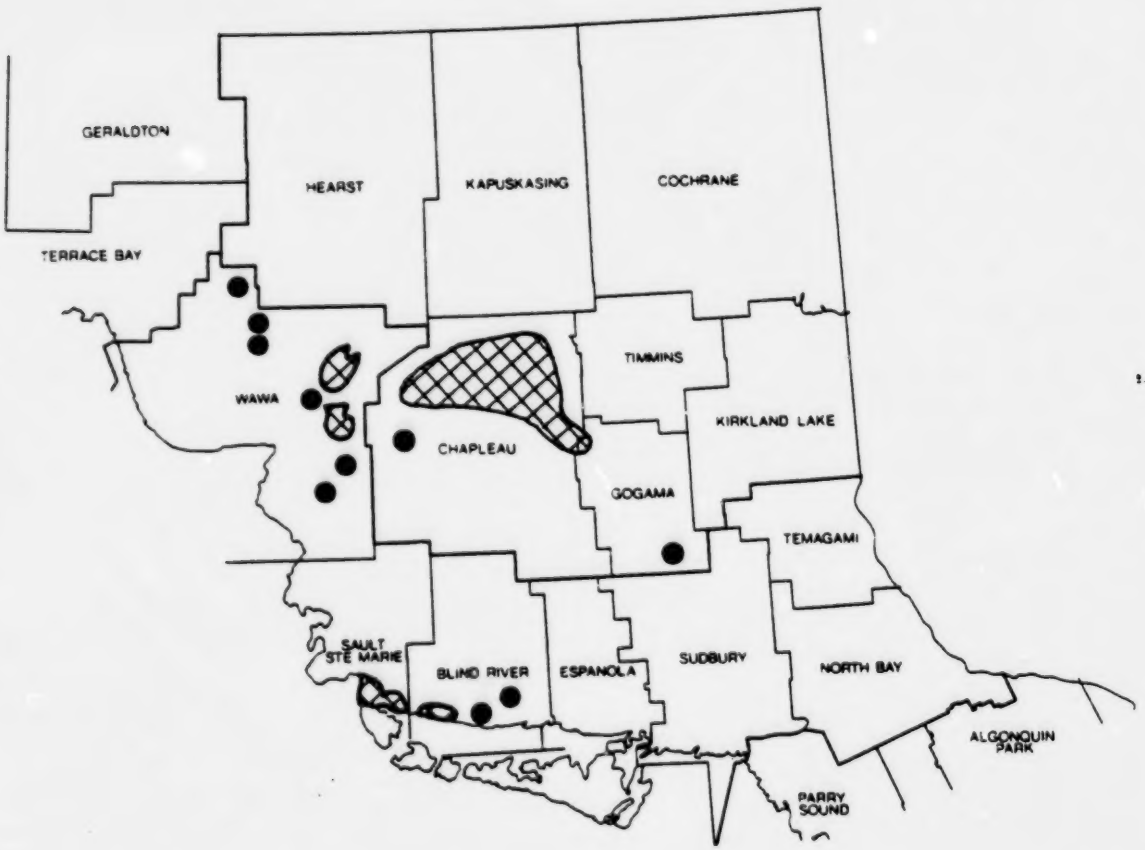
0 Kilometres 96

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

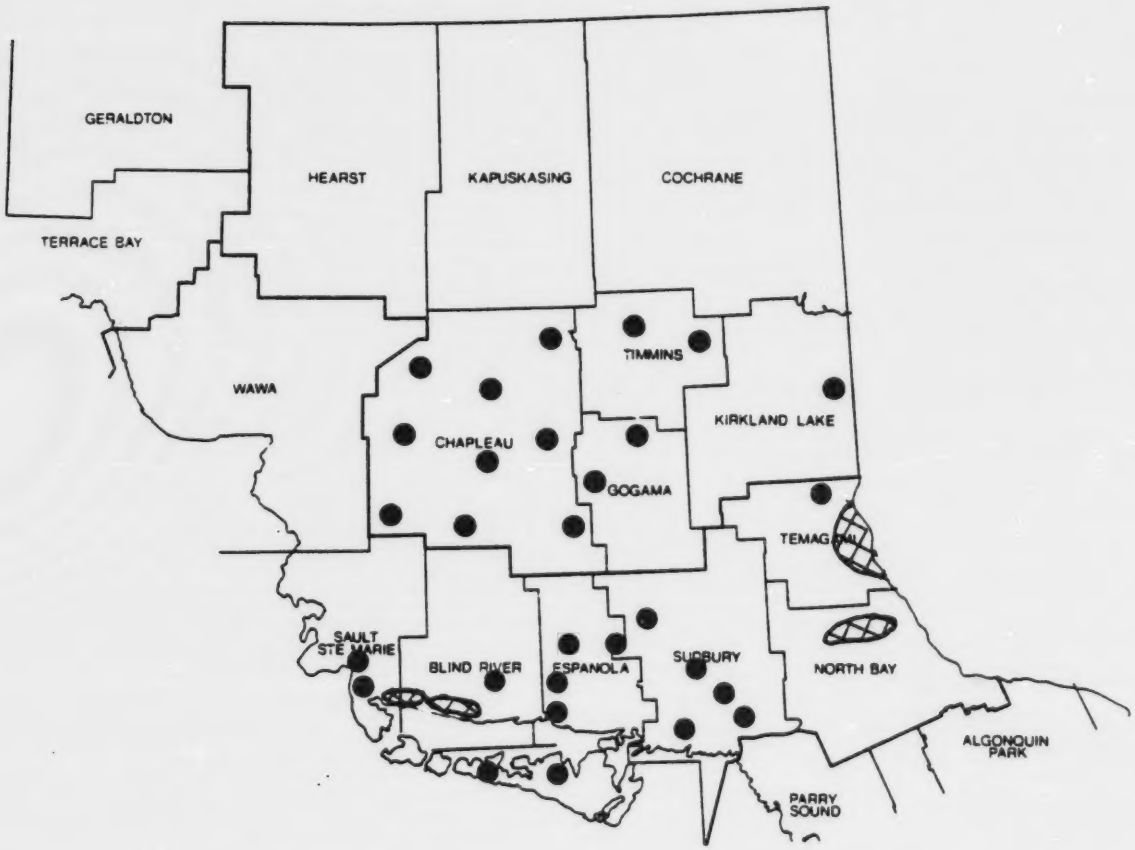
Large Aspen Tortrix

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Large Aspen Tortrix

Areas within which defoliation occurred in 1971

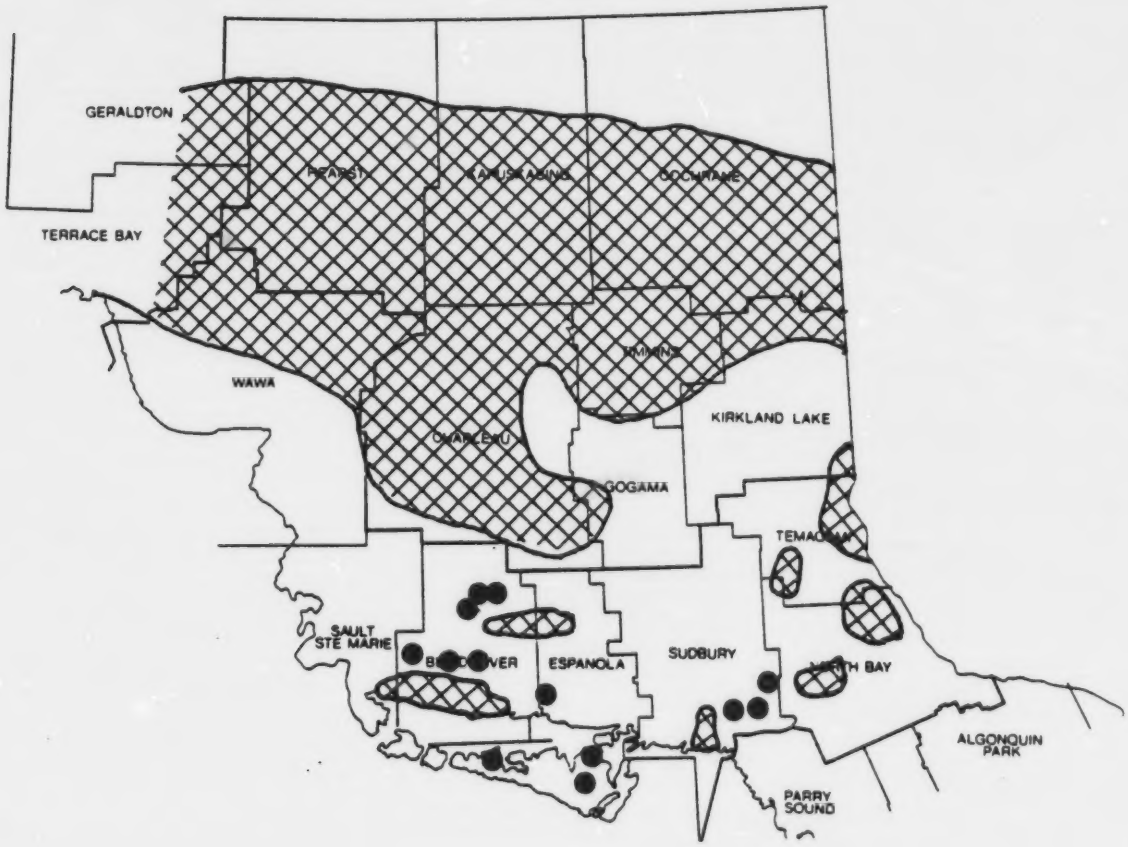
0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

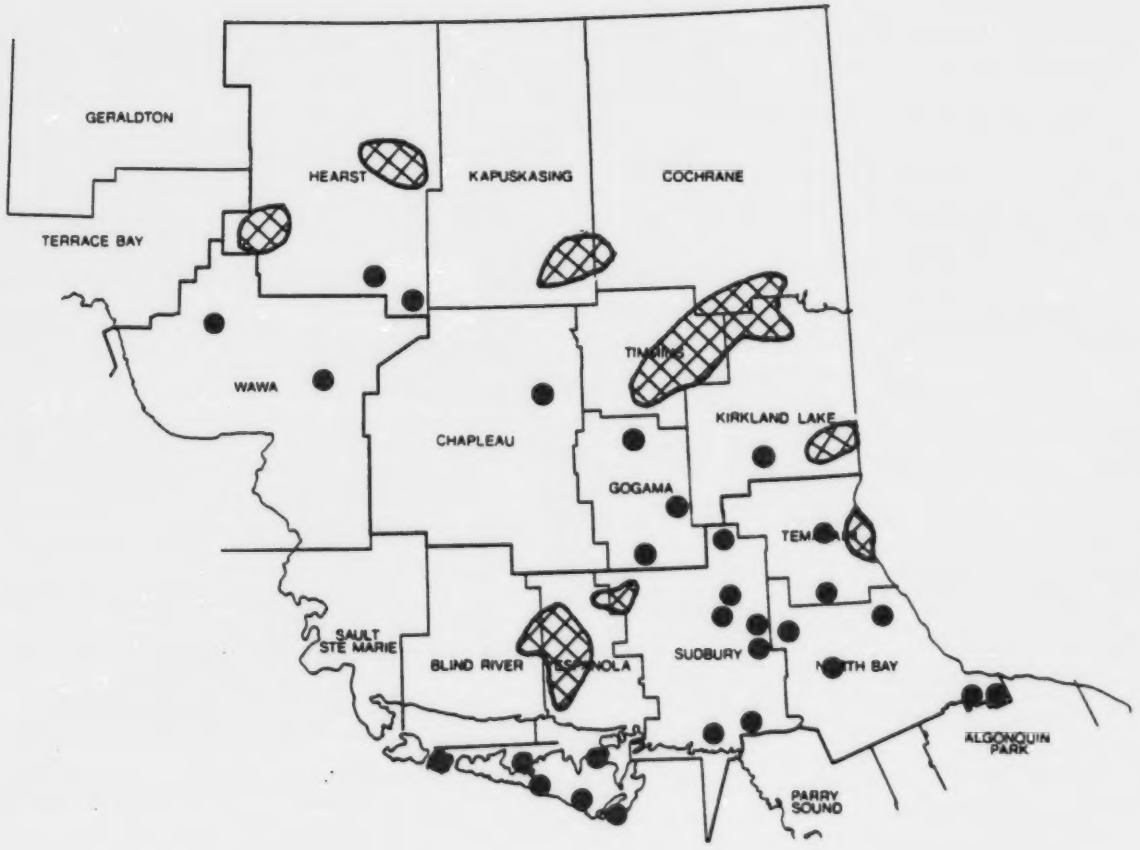
Large Aspen Tortrix

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Large Aspen Tortrix

Areas within which defoliation occurred in 1973

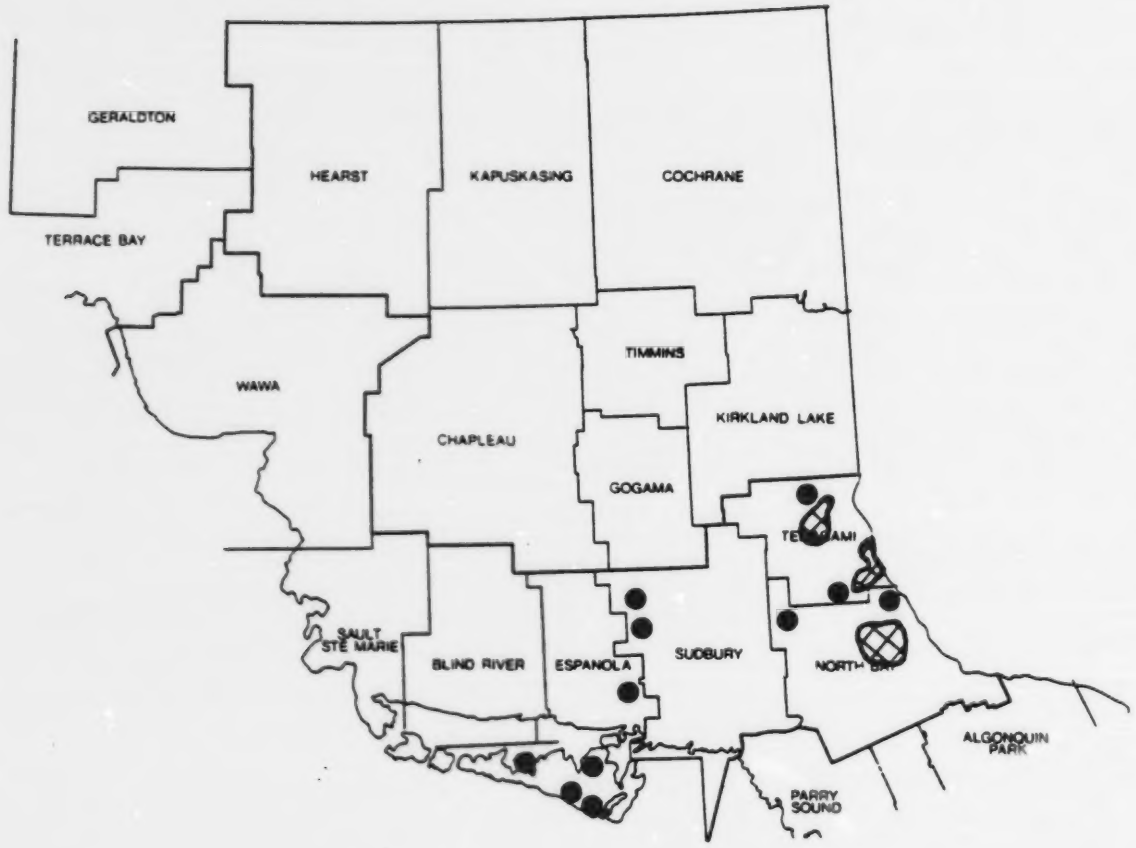
0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Large Aspen Tortrix

Areas within which defoliation occurred in 1974

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

Large Aspen Tortrix

Areas within which defoliation occurred in 1975

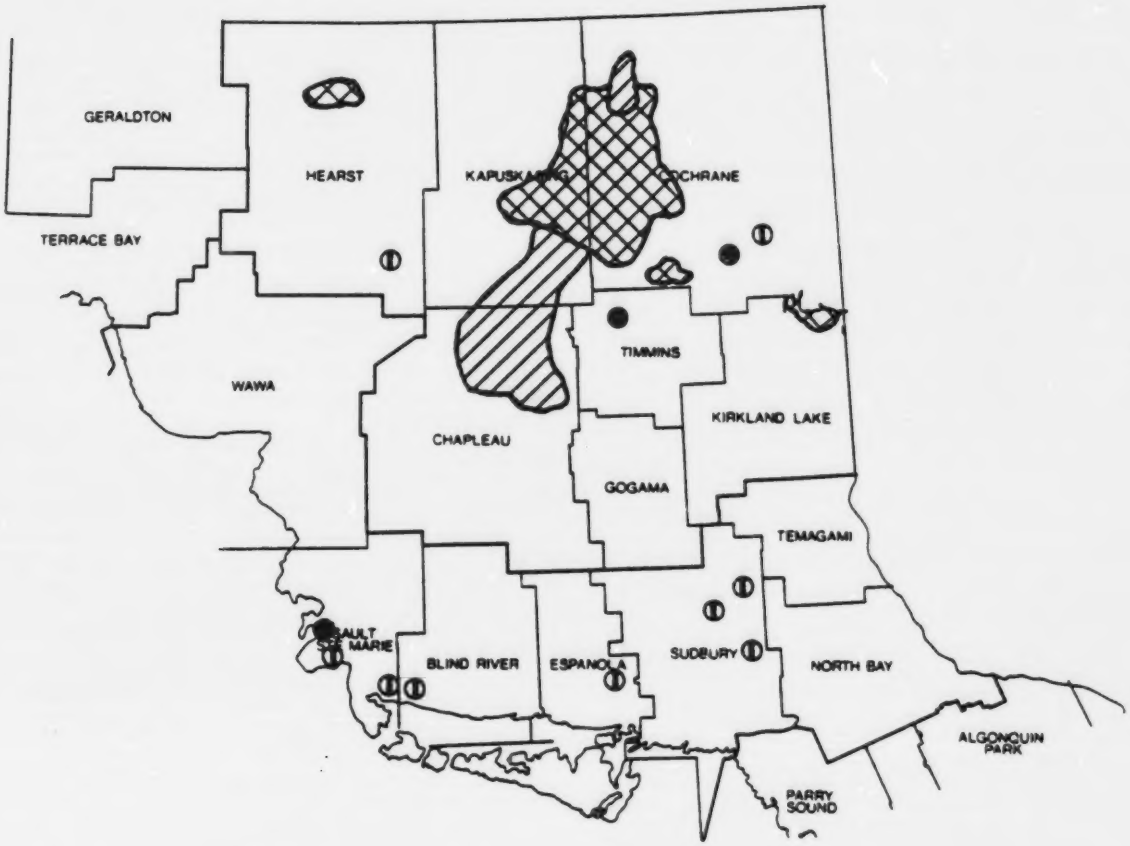
0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which defoliation occurred in 1950

0 Miles 60

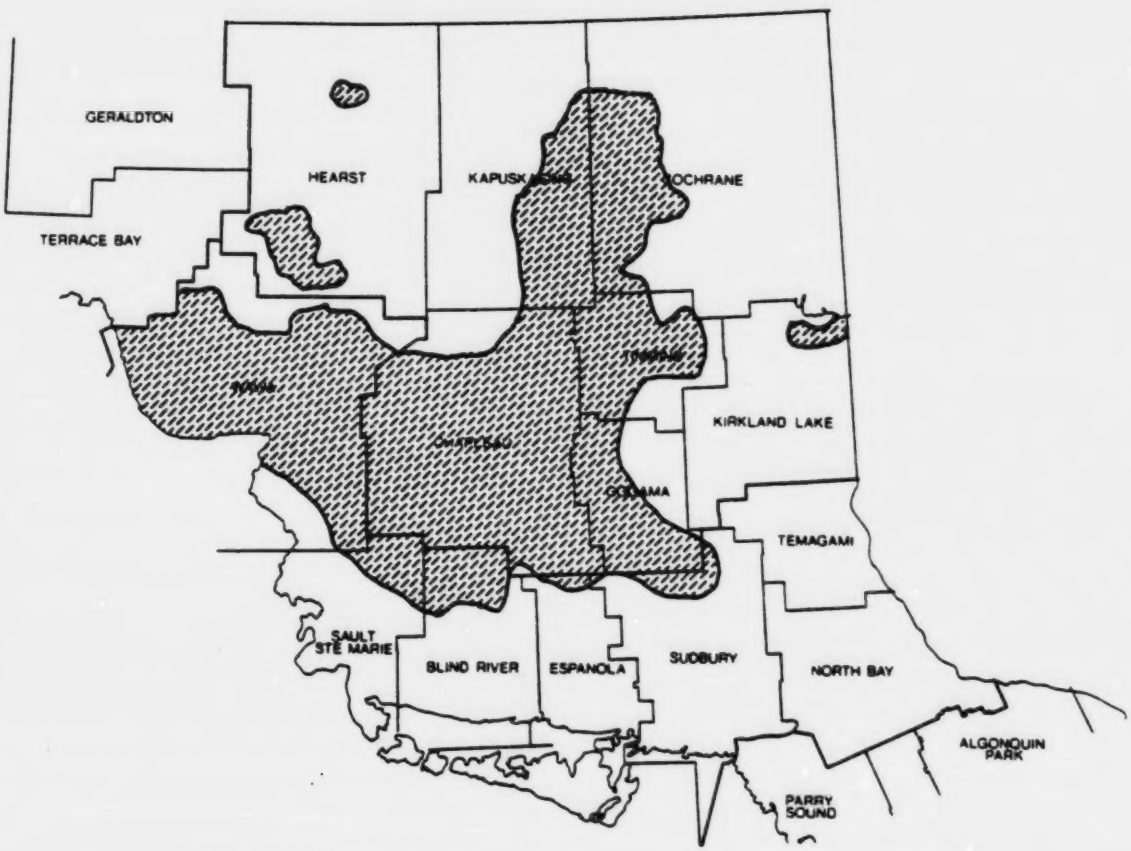
0 Kilometres 96

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1950

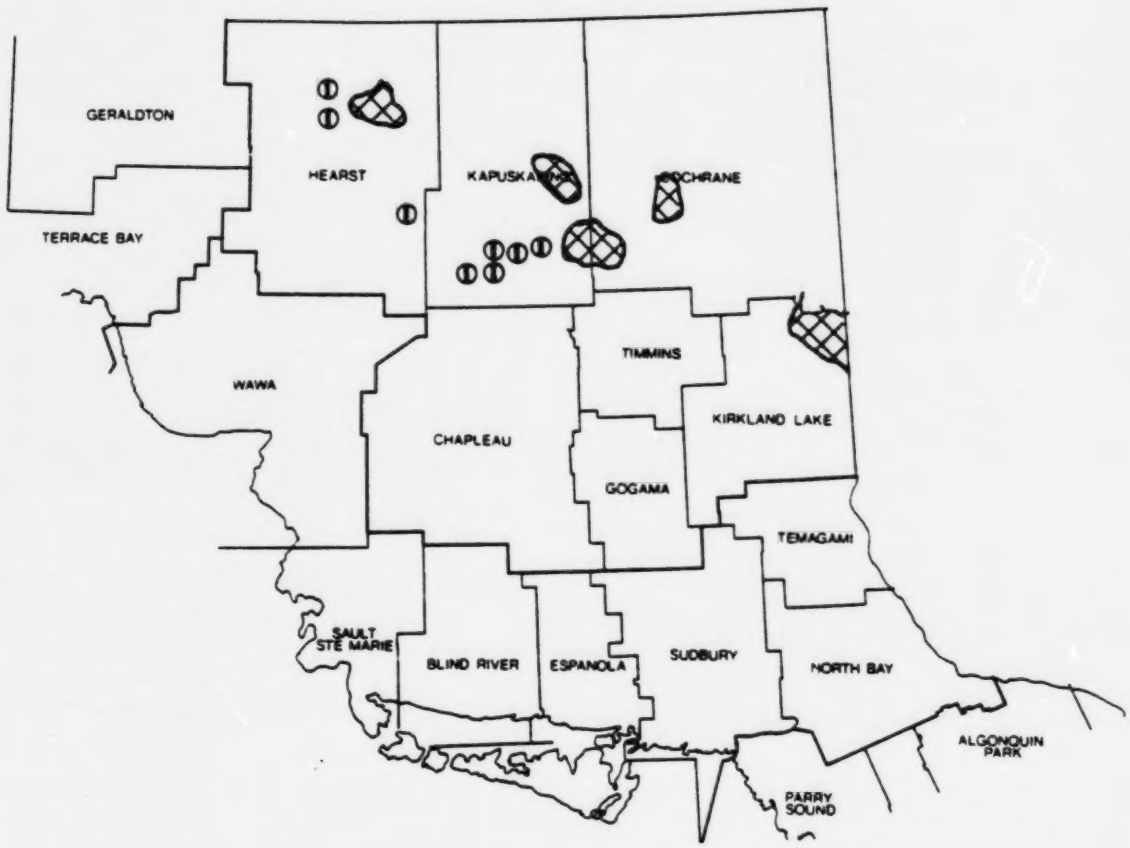
0 Miles 60

0 Kilometres 96

LEGEND

Mortality

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which defoliation occurred in 1951

LEGEND

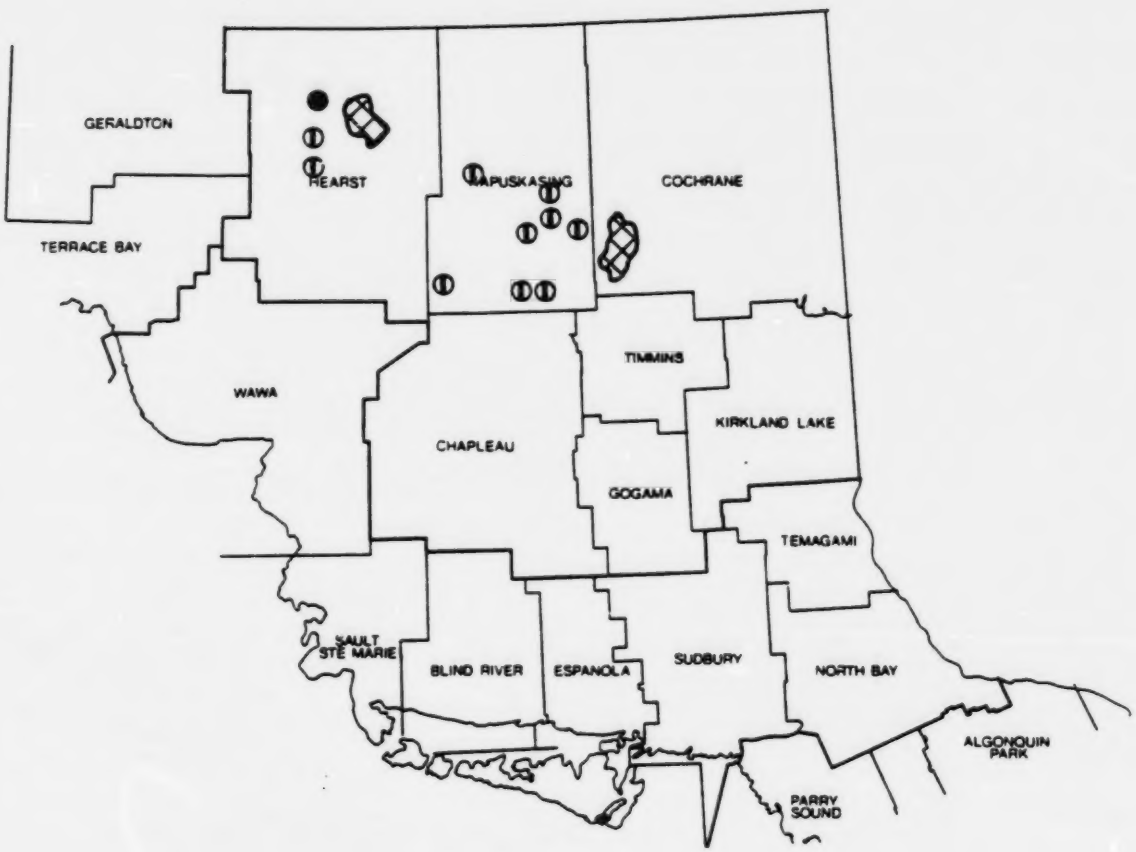
Light defoliation ◑

Moderate-to-severe defoliation ▨

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Spruce Budworm

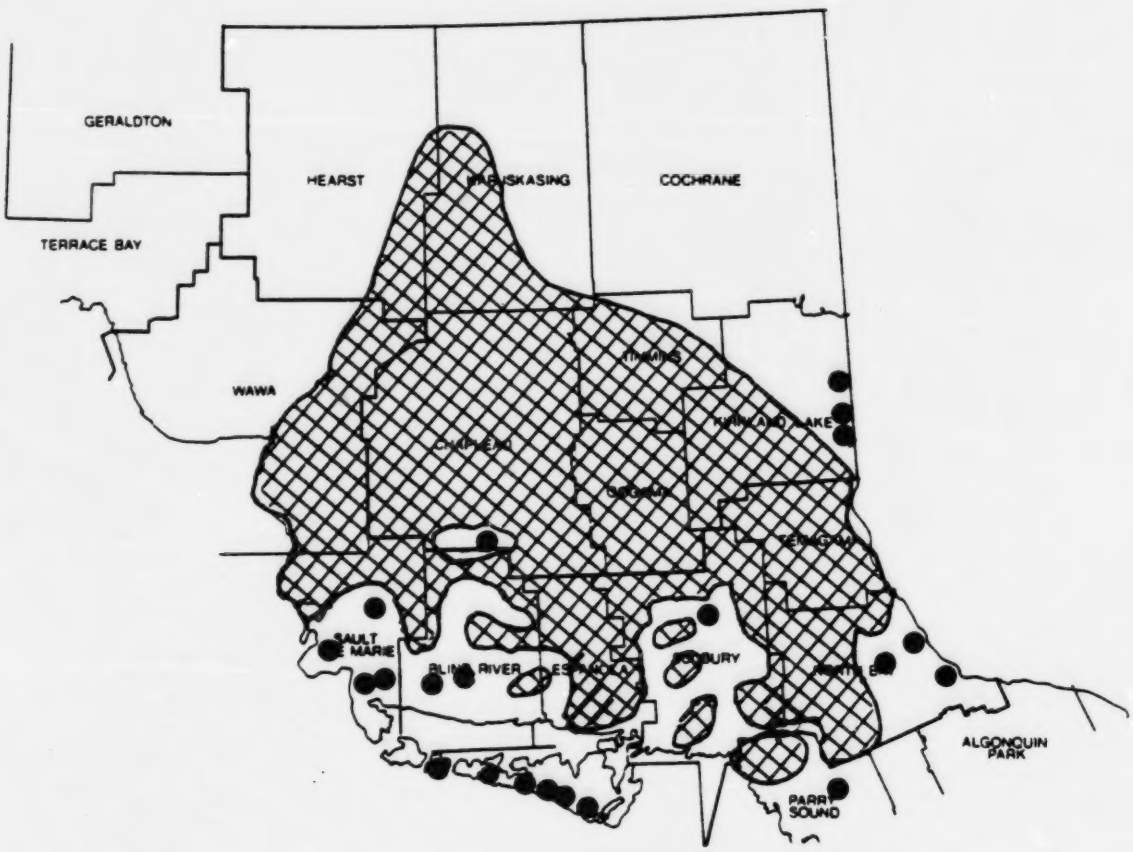
Areas within which defoliation occurred in 1952

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which defoliation occurred in 1974

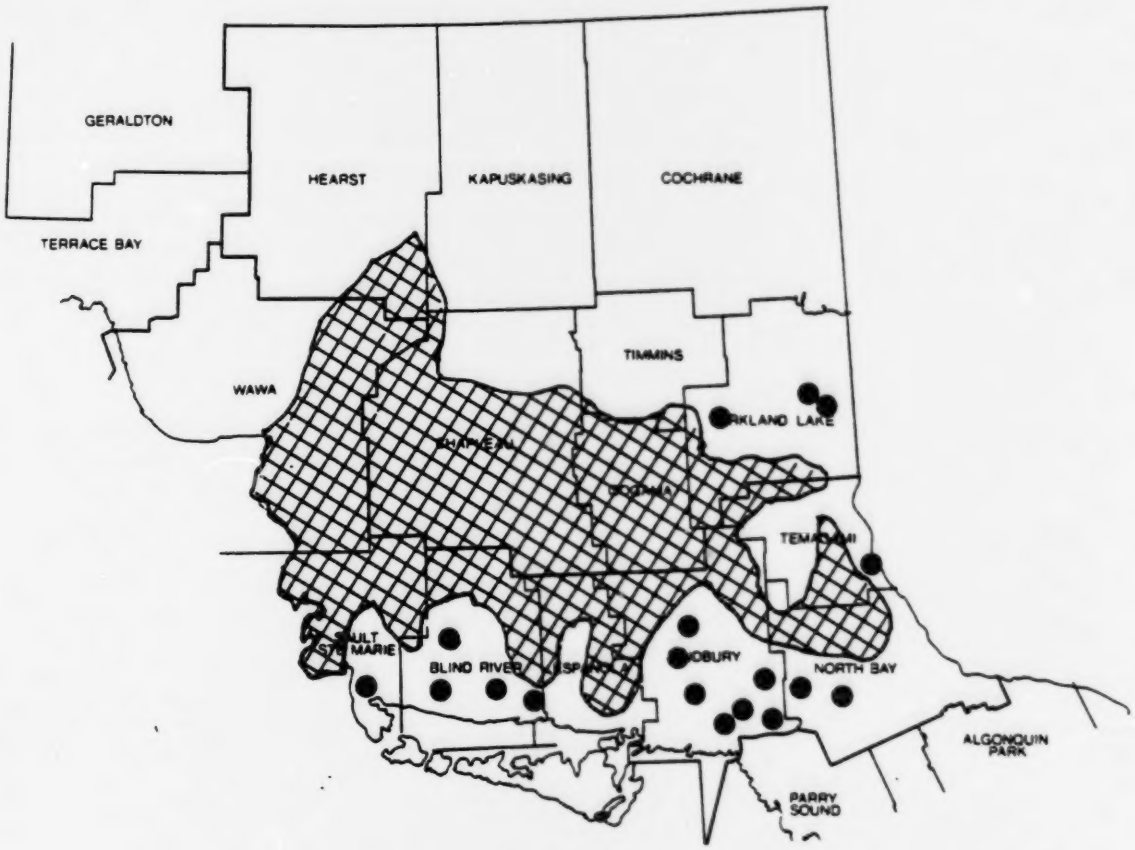
LEGEND

Moderate-to-severe defoliation ● or ▨

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Spruce Budworm

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO

Spruce Budworm

Areas within which defoliation occurred in 1953

0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

Spruce Budworm

Areas within which defoliation occurred in 1954

LEGEND

Light defoliation ①

Moderate-to-severe defoliation

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Spruce Budworm

Areas within which defoliation occurred in 1955

LEGEND

Light defoliation ① or

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

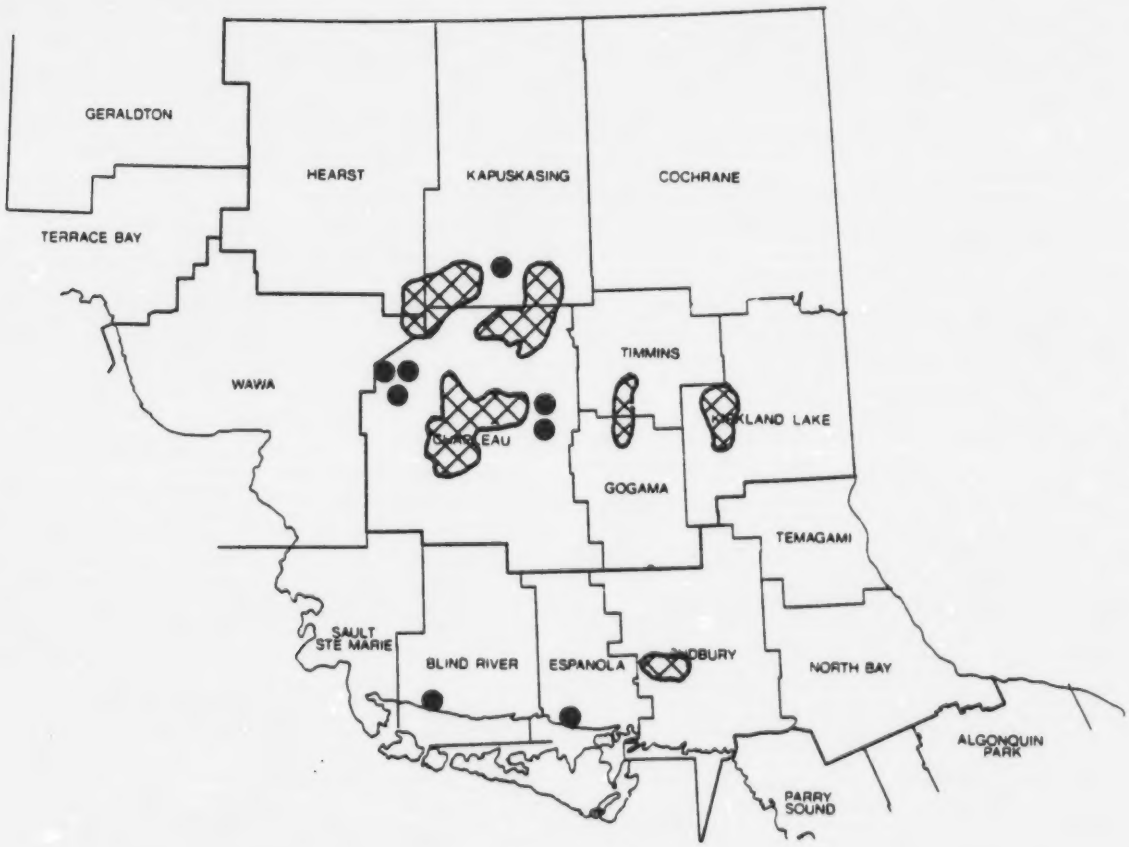
Spruce Budworm

Areas within which defoliation occurred in 1956

LEGEND

Light defoliation

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

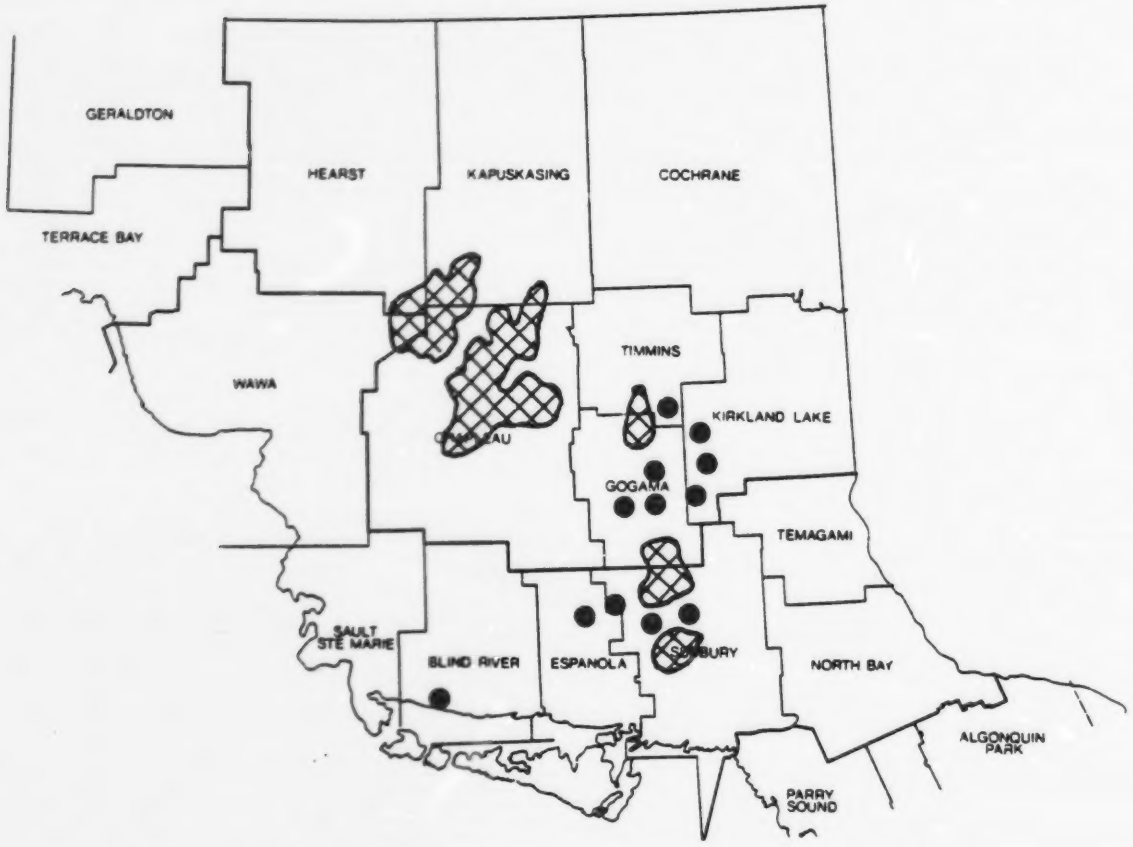
Spruce Budworm

Areas within which defoliation occurred in 1968

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Spruce Budworm

Areas within which defoliation occurred in 1969

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

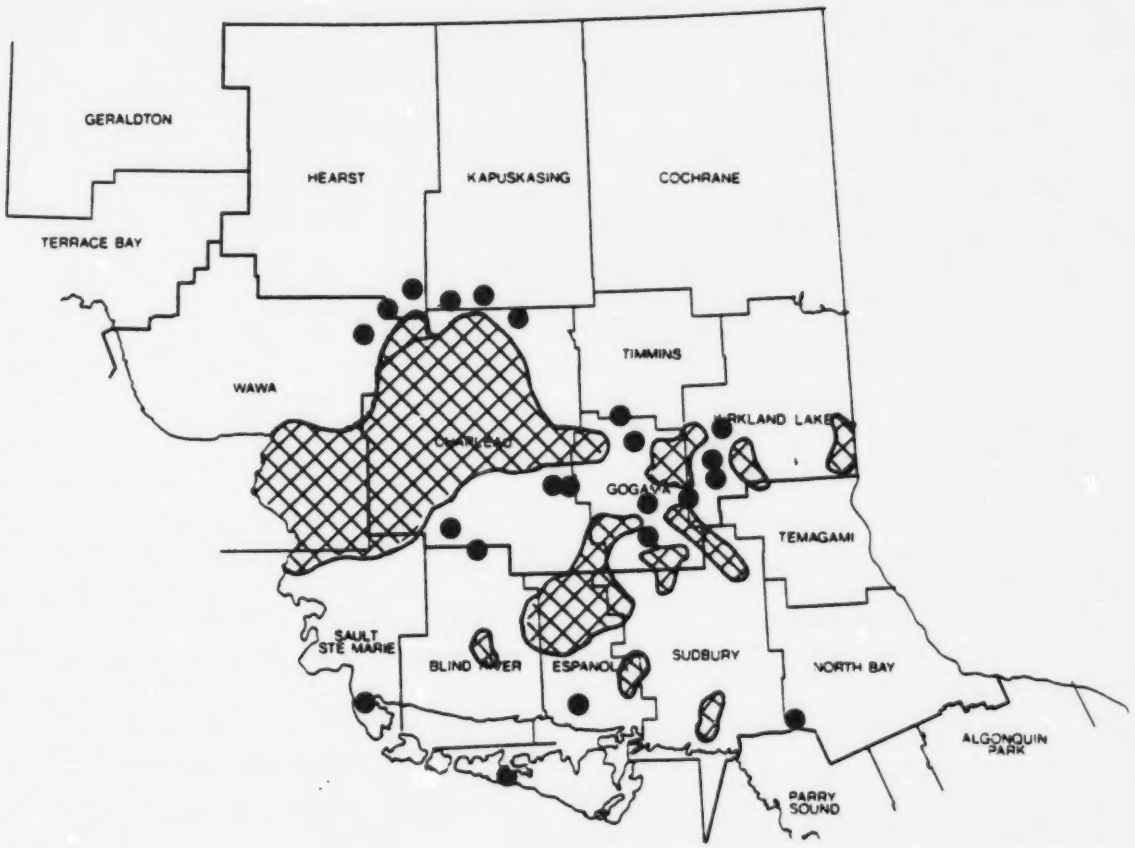
Spruce Budworm

Areas within which defoliation occurred in 1970

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

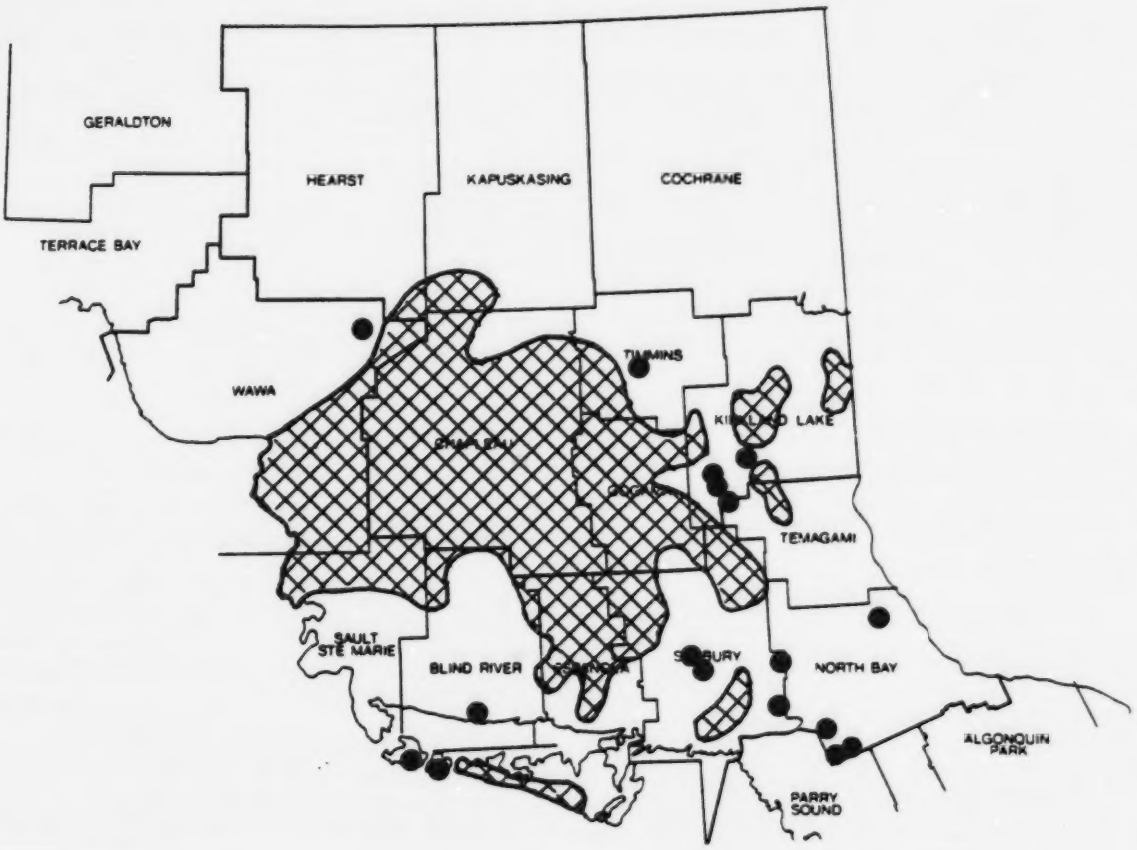
Spruce Budworm

Areas within which defoliation occurred in 1971

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

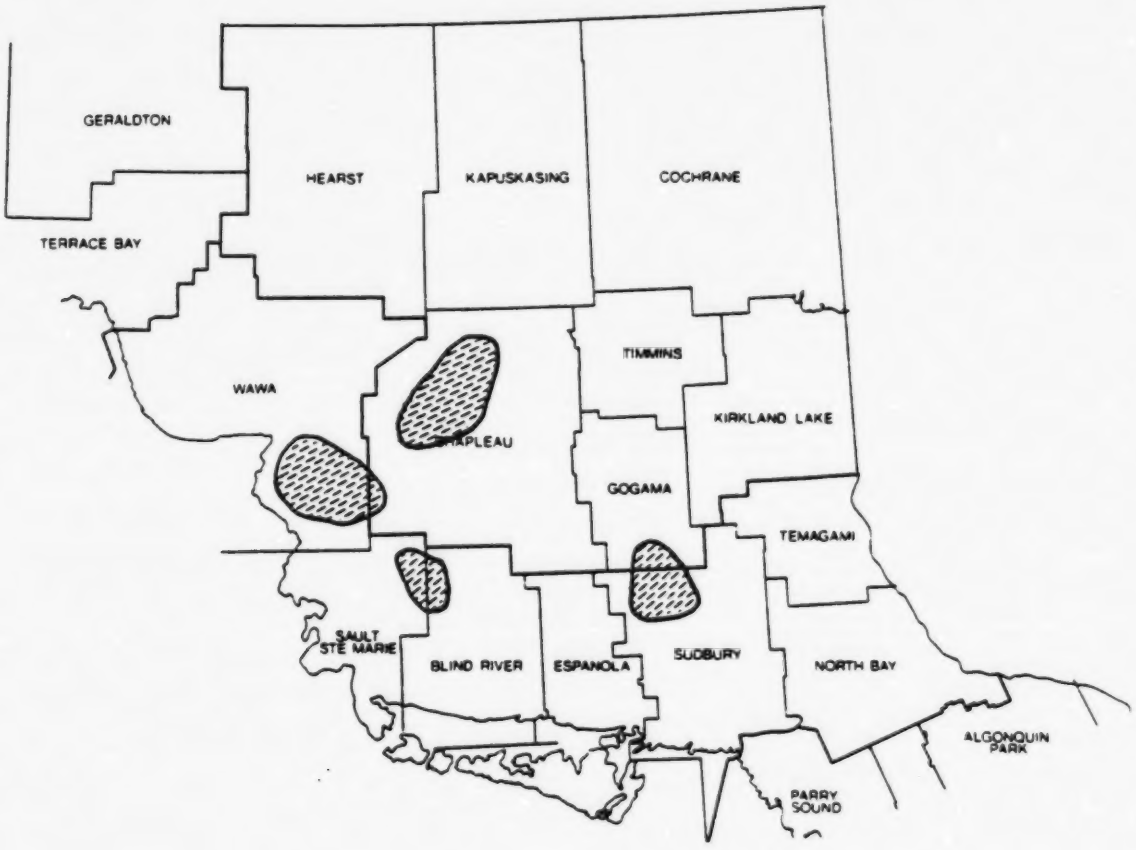
Spruce Budworm

Areas within which defoliation occurred in 1972

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1974

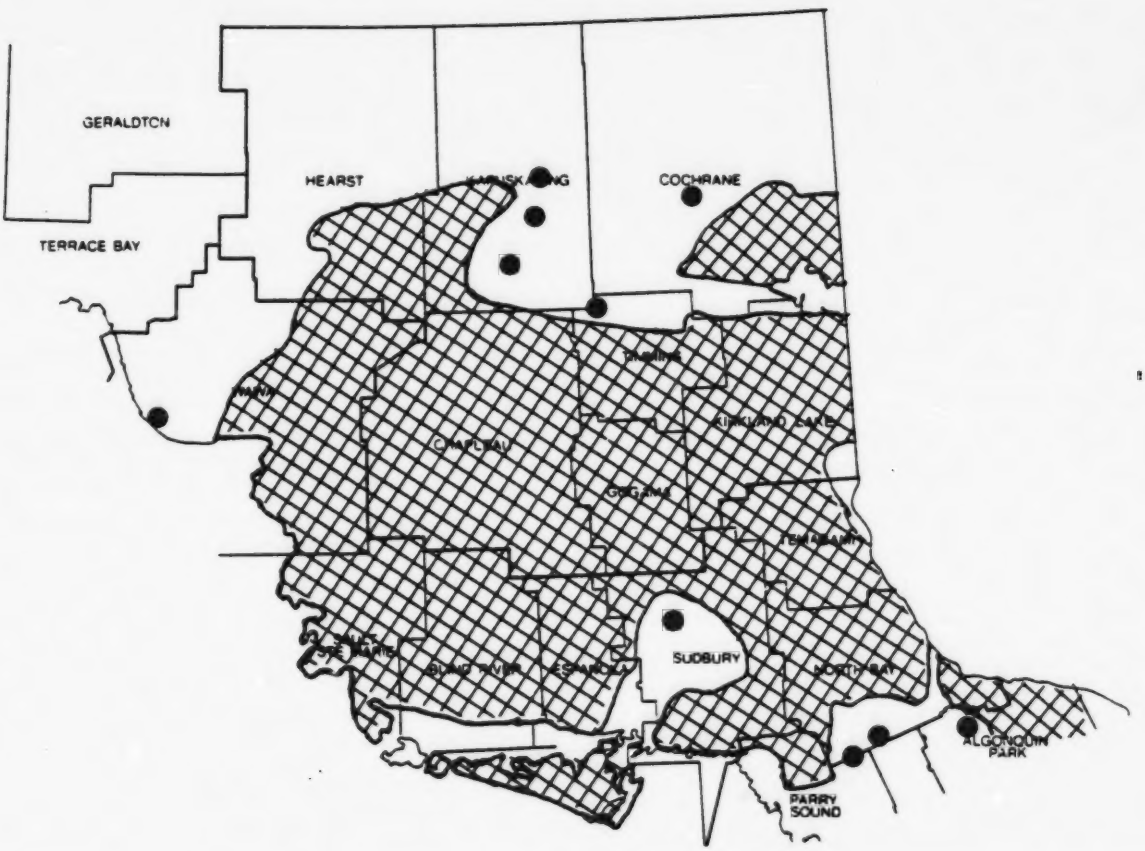
0 Miles 60

0 Kilometres 96

LEGEND

Mortality

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

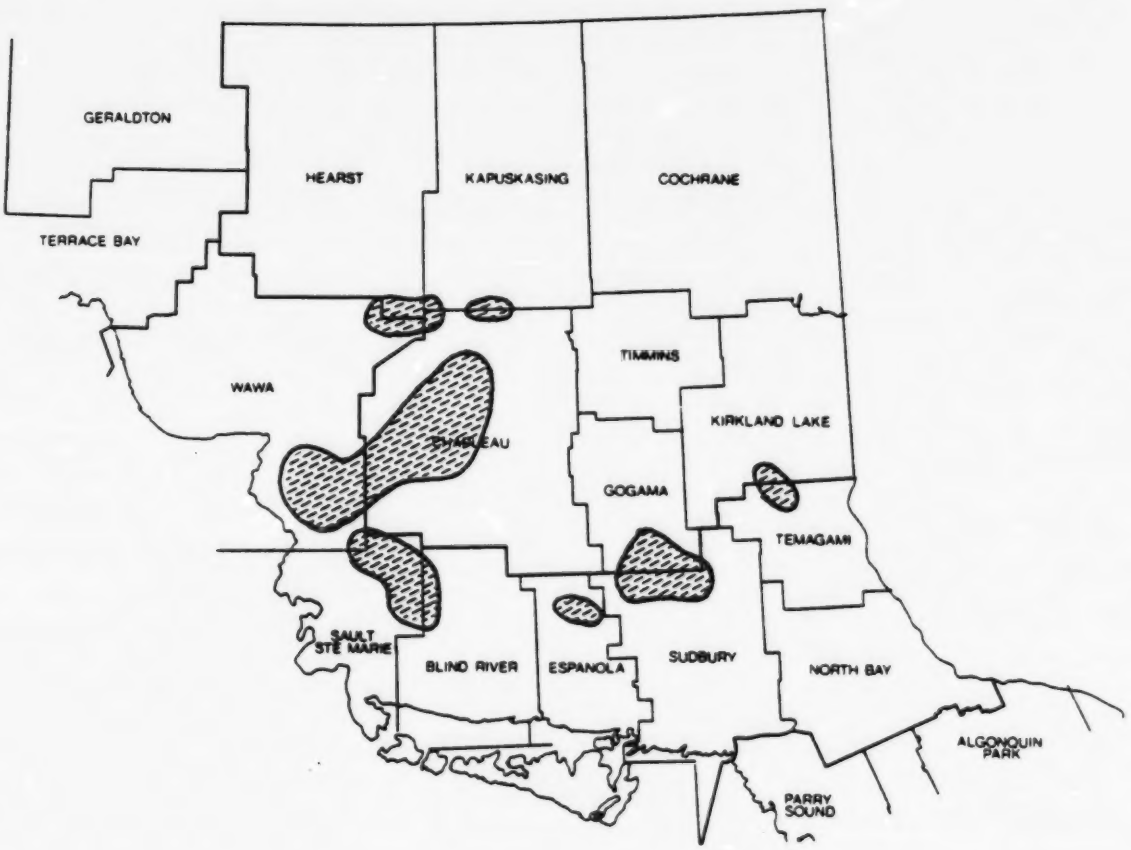
Spruce Budworm

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1975

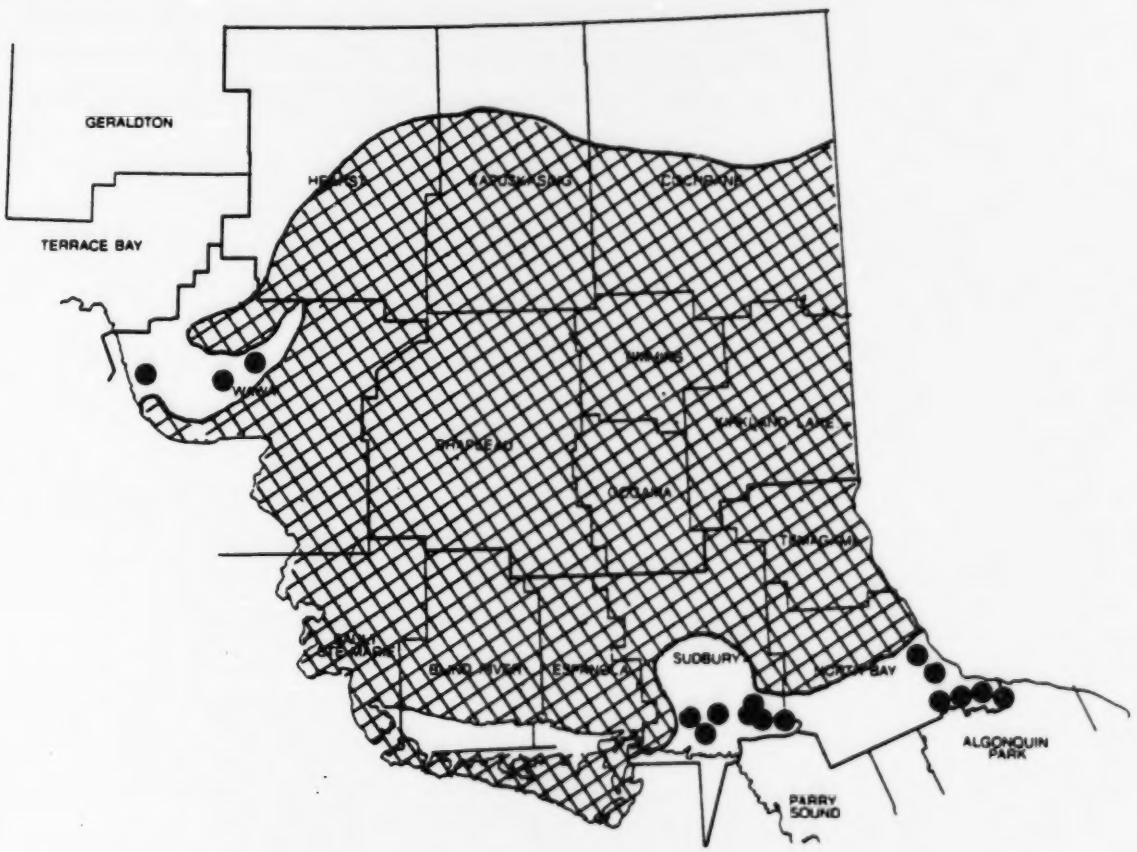
LEGEND

Mortality

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Spruce Budworm

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1976

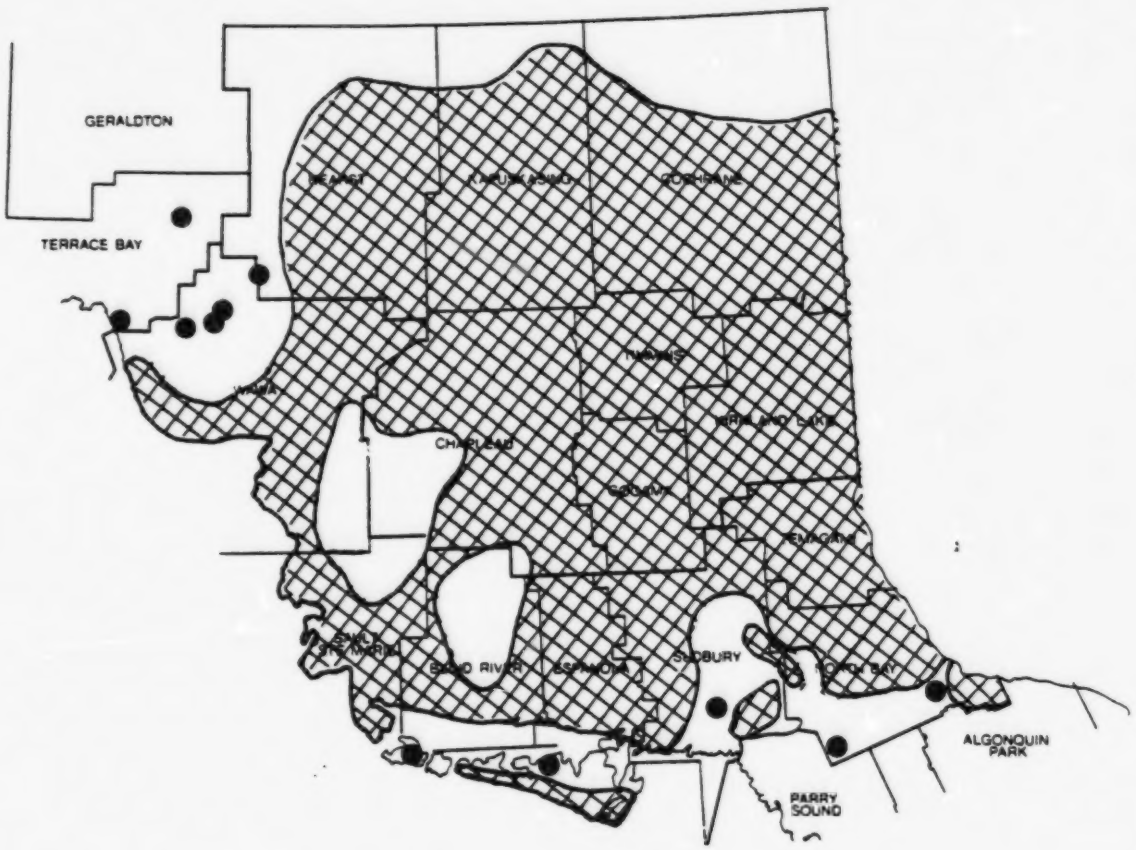
LEGEND

Mortality

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

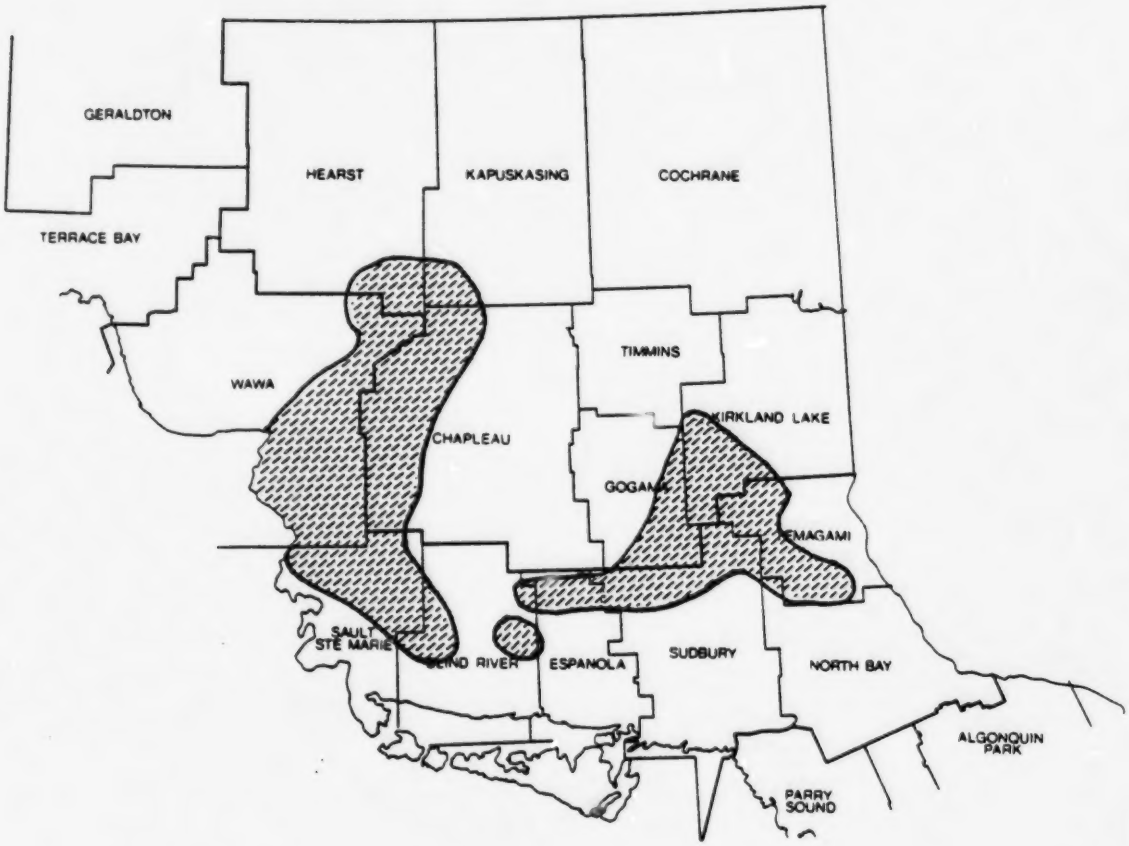
Spruce Budworm

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1977

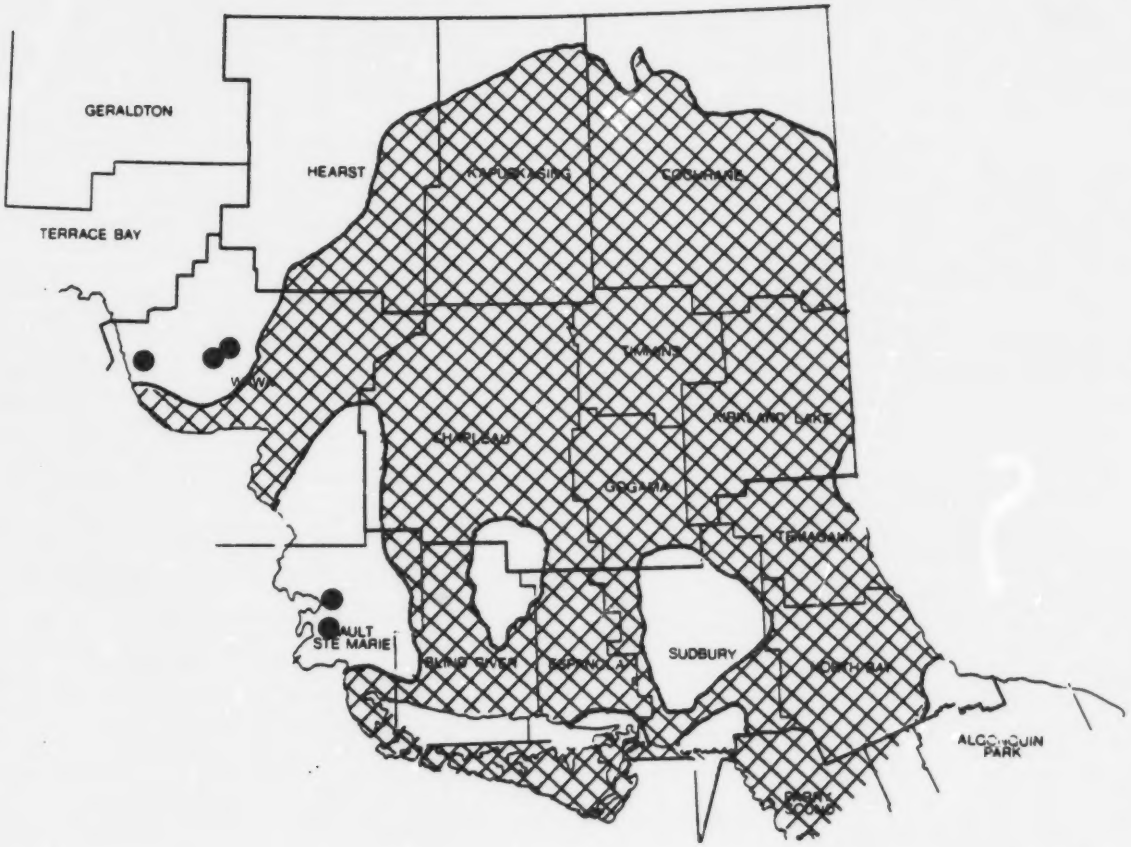
LEGEND

Mortality

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

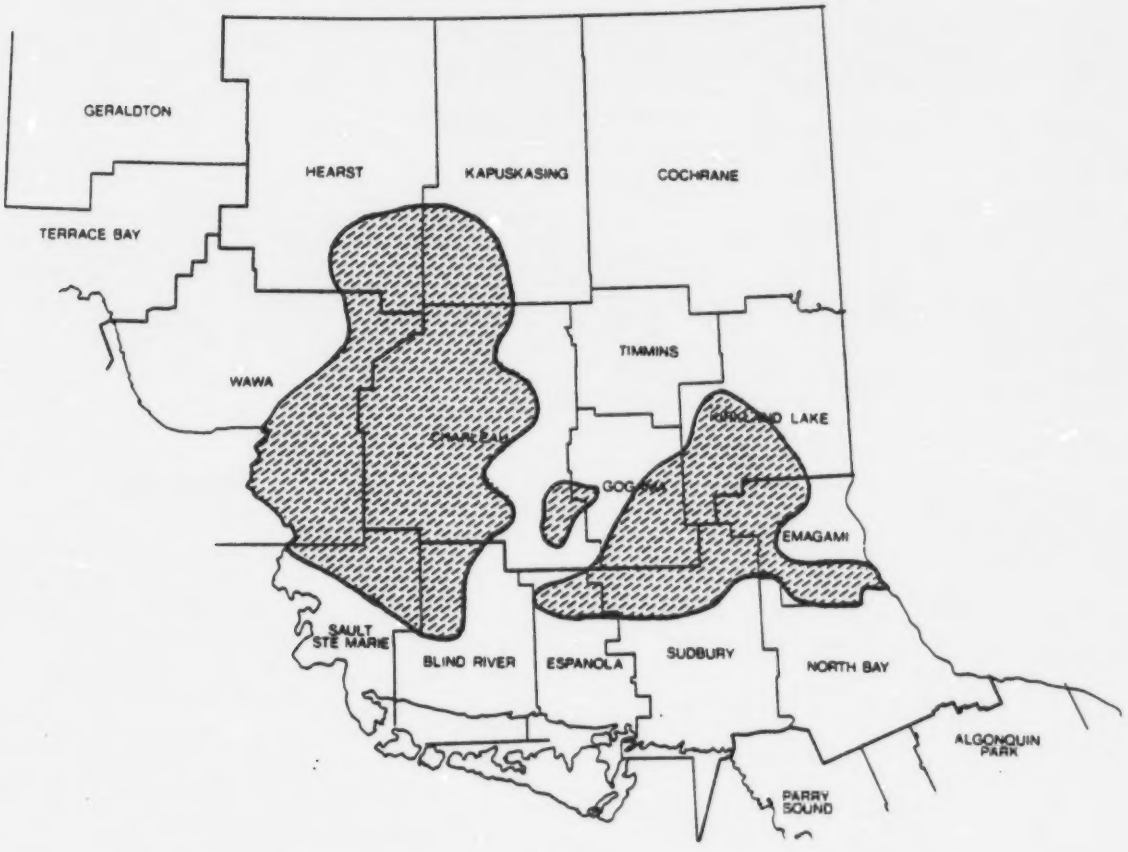
Spruce Budworm

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1978

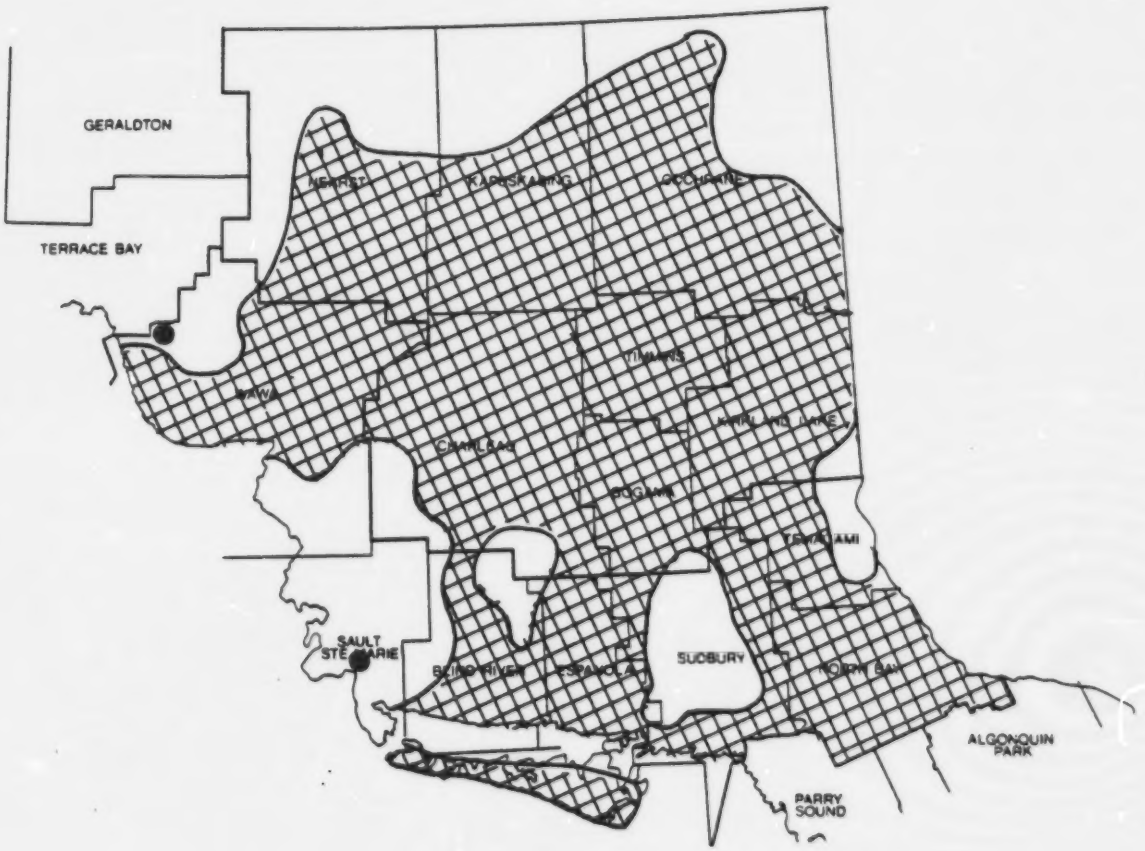
0 Miles 60

0 Kilometres 96

LEGEND

Mortality

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

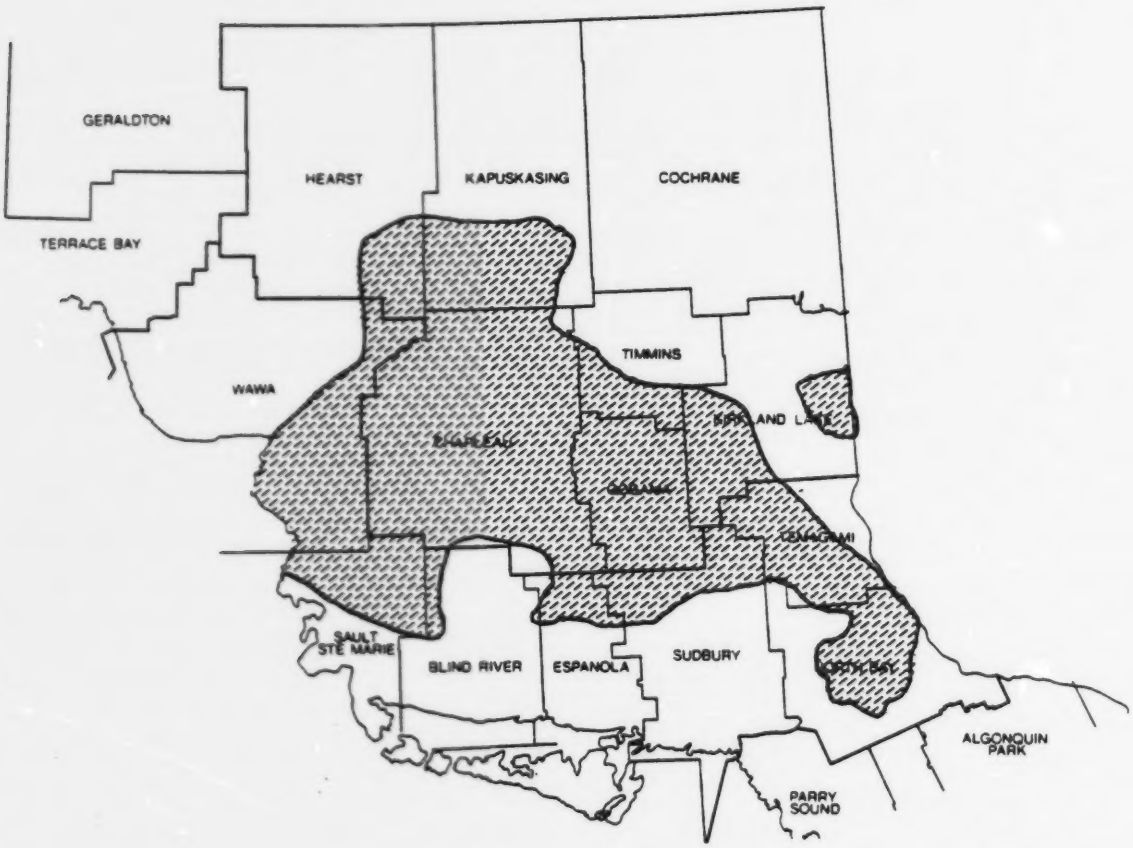
Spruce Budworm

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1979

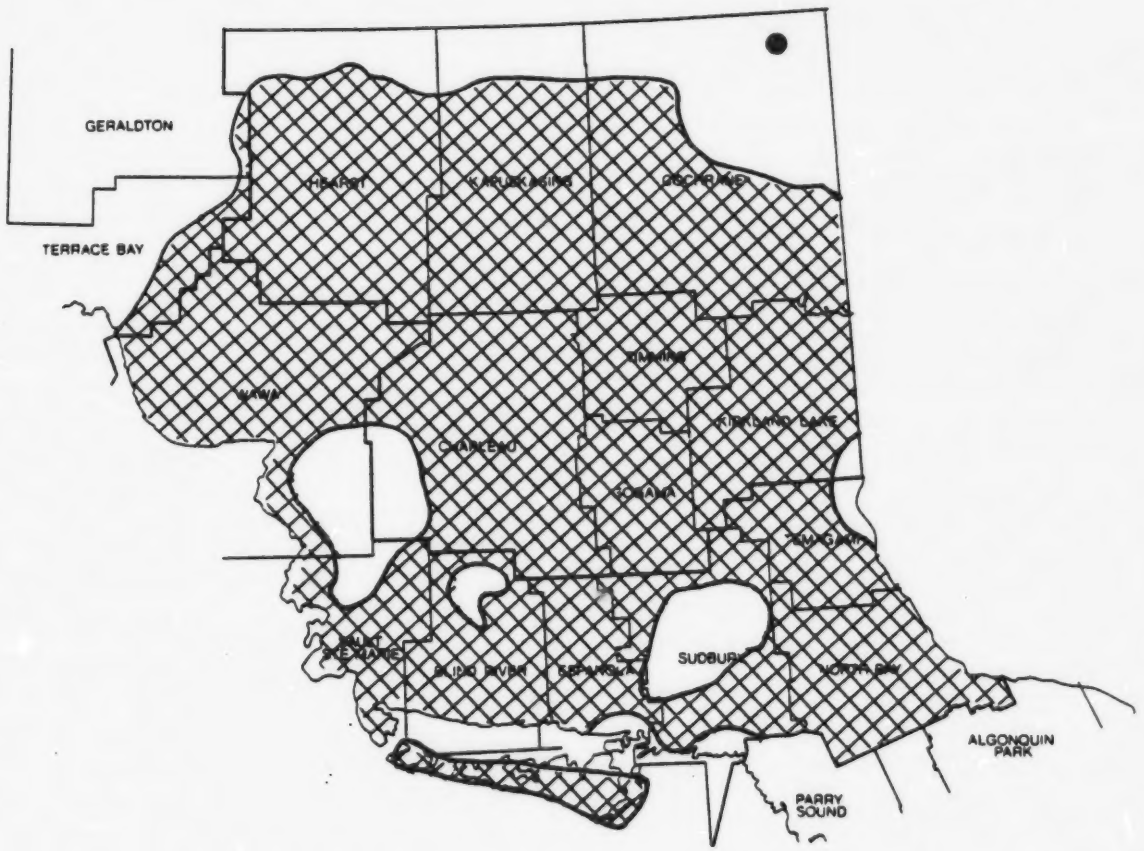
LEGEND

Mortality

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

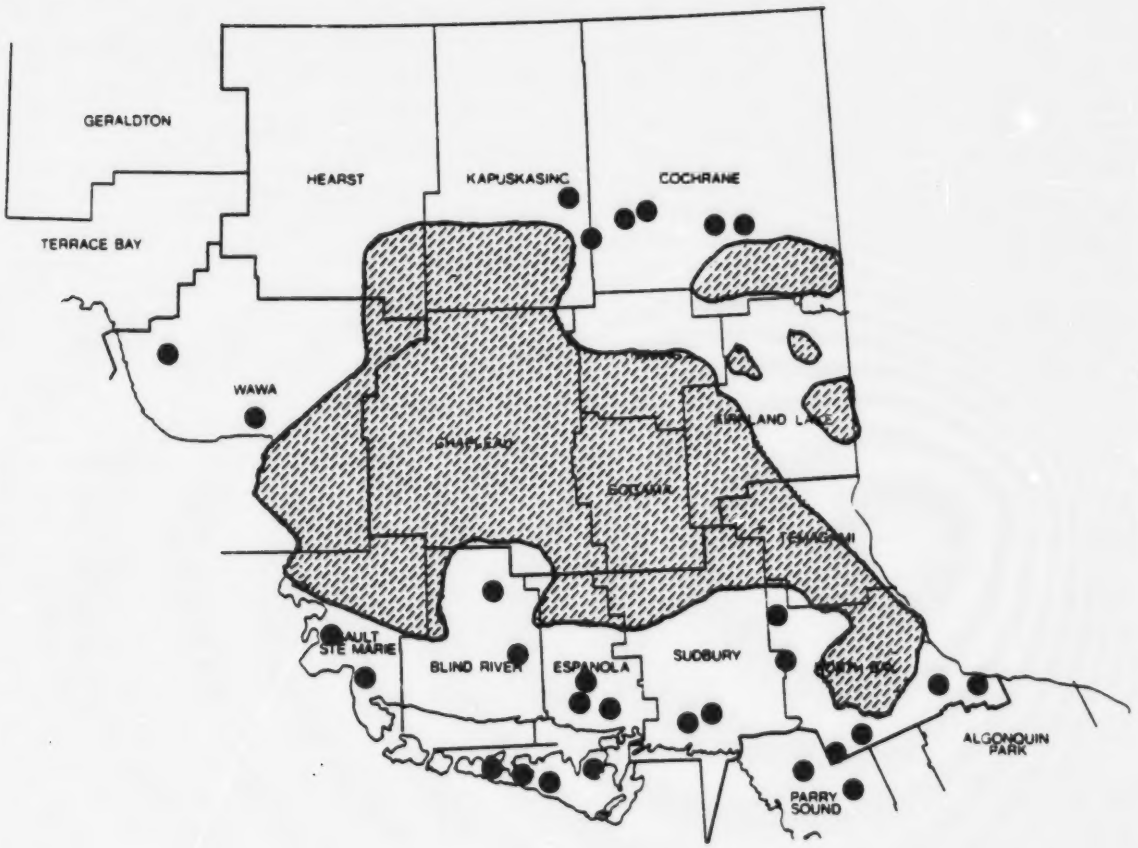
Spruce Budworm

Areas within which defoliation occurred in 1980

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Spruce Budworm

Areas within which balsam fir whole tree and top mortality occurred in 1980

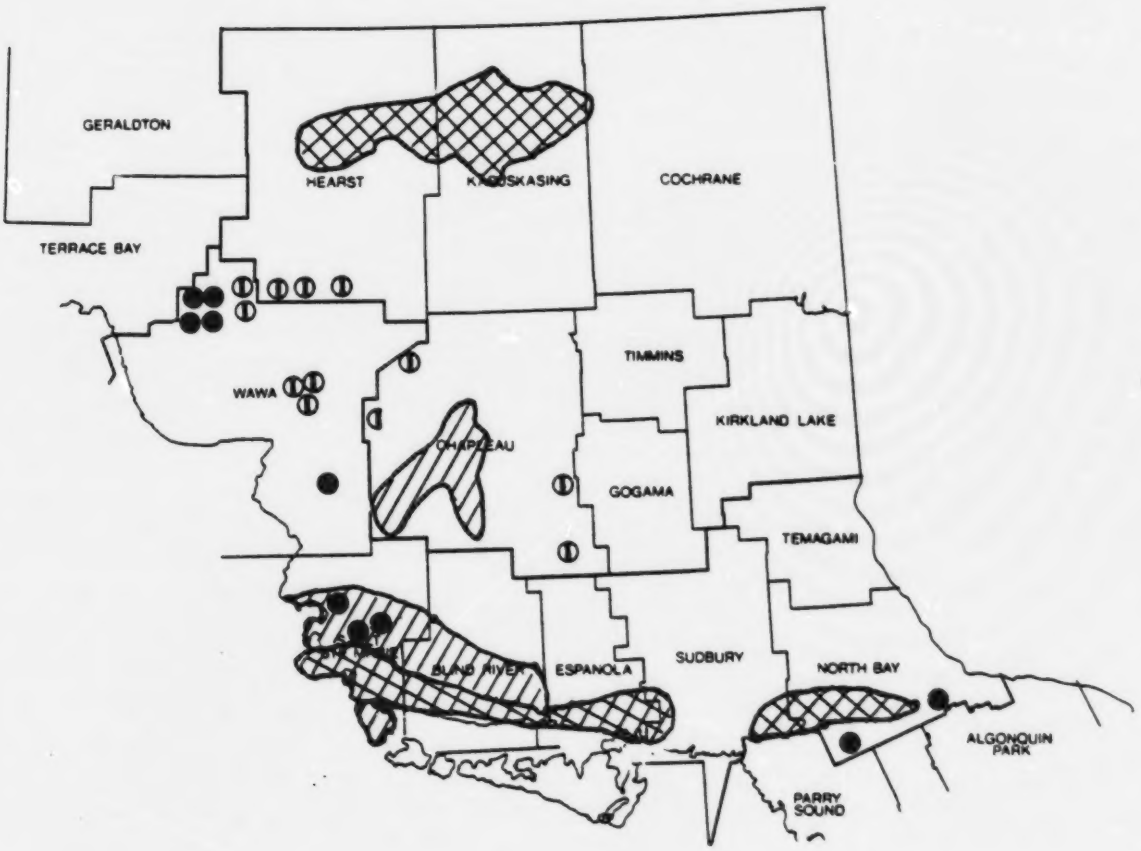
0 Miles 60

0 Kilometres 96

LEGEND

Mortality or

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

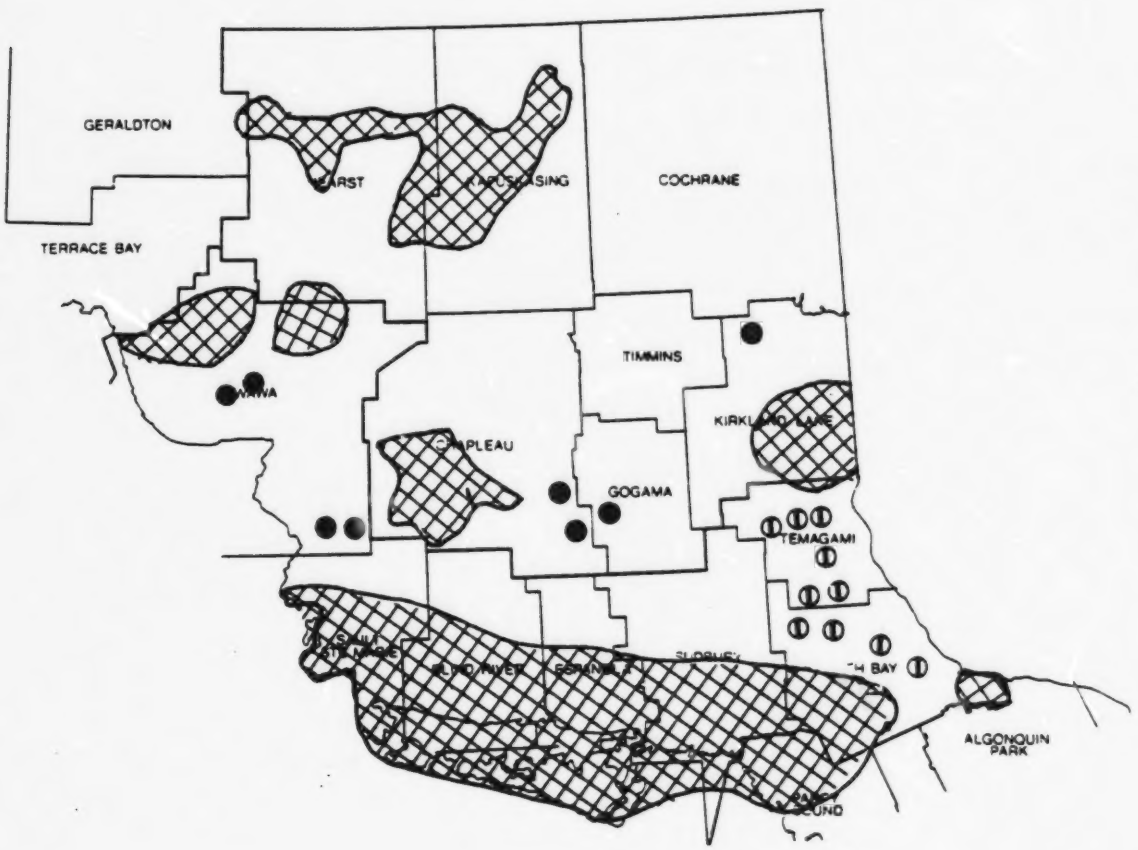
Areas within which defoliation occurred in 1950

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Forest Tent Caterpillar

0 Miles 60

0 Kilometres 96

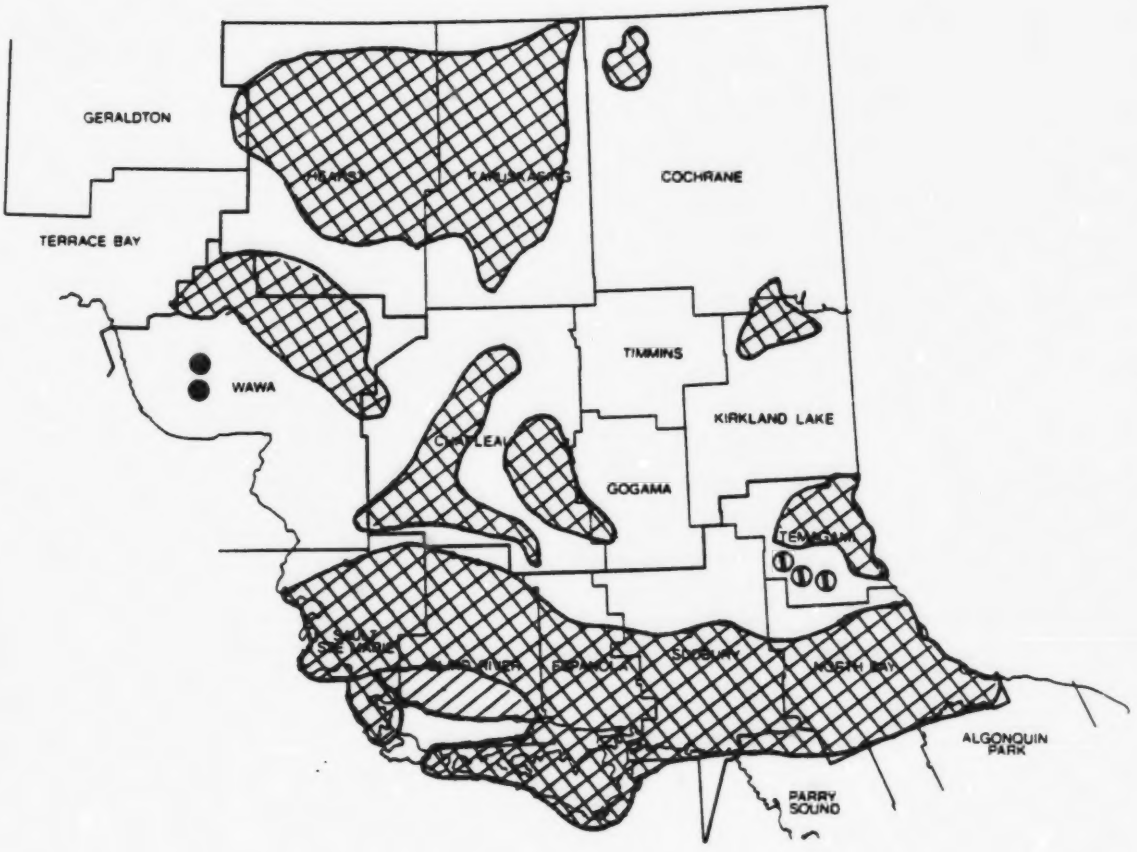
Areas within which defoliation occurred in 1951

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1952

0 Miles 60

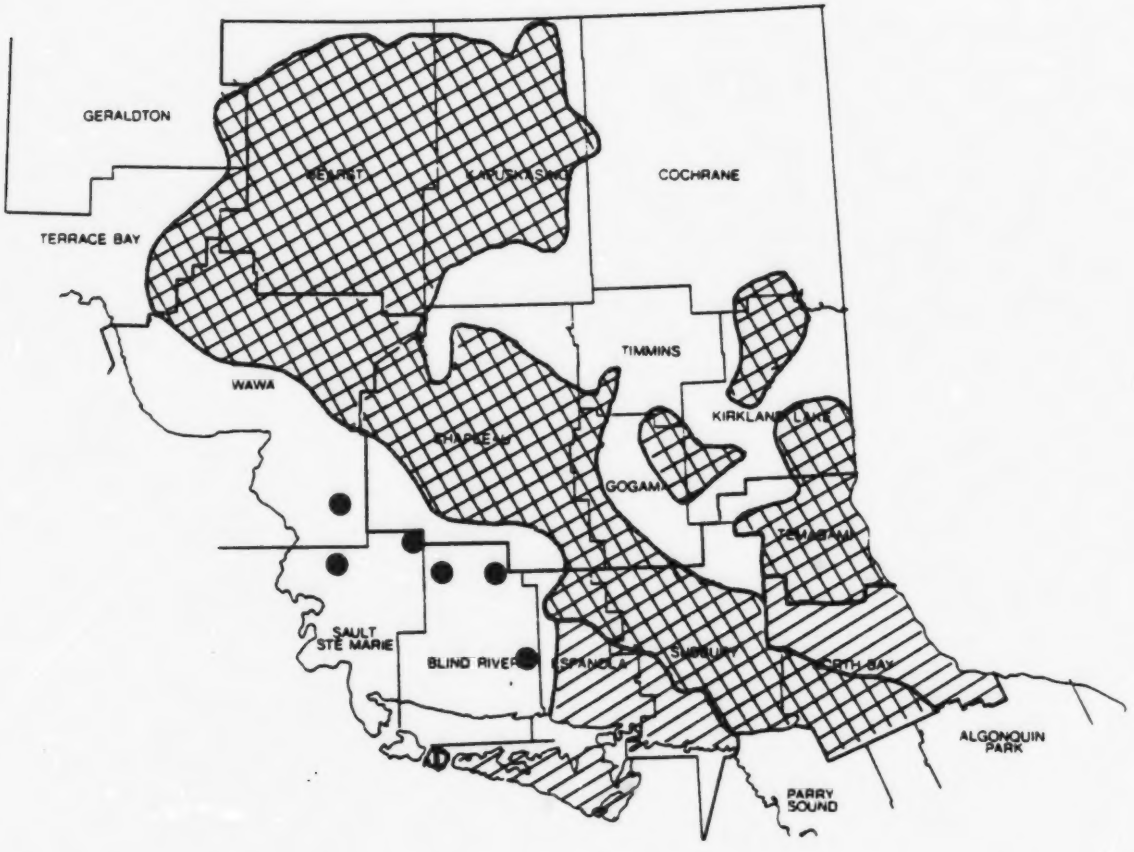
0 Kilometres 96

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1953

0 Miles 60

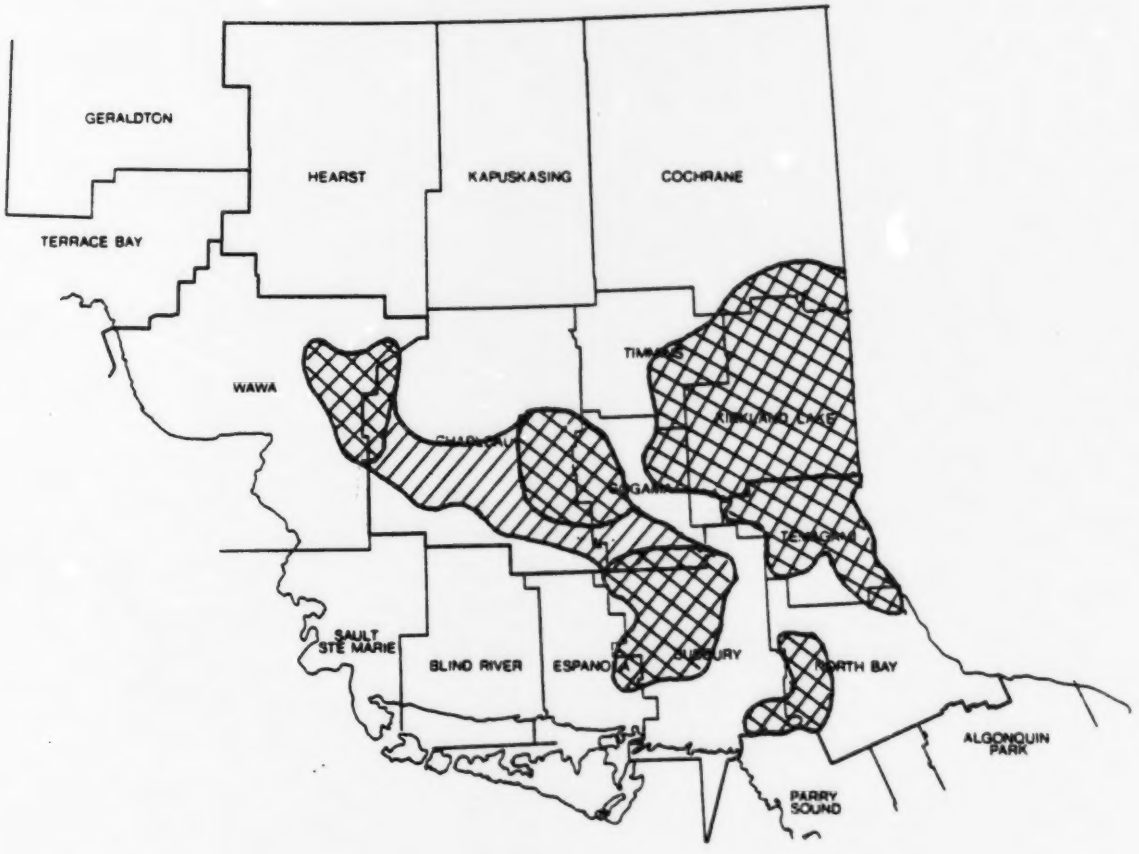
0 Kilometres 96

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO



Forest Tent Caterpillar

Areas within which defoliation occurred in 1954

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1955

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ◐ or

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1956

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1957

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1960

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1961

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ◑

Moderate-to-severe defoliation ●

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1962

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ①

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1963

LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1964

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ◐ or ▨

Moderate-to-severe defoliation ● or ▩

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1965

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ① or

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1966

LEGEND

Light defoliation

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO

0 Miles 60
0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1967

LEGEND

Light defoliation ①

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1968

LEGEND

Light defoliation

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1969

0 Miles 60

0 Kilometres 96

LEGEND

Light defoliation ◐

Moderate-to-severe defoliation ●

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1973

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1974

0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

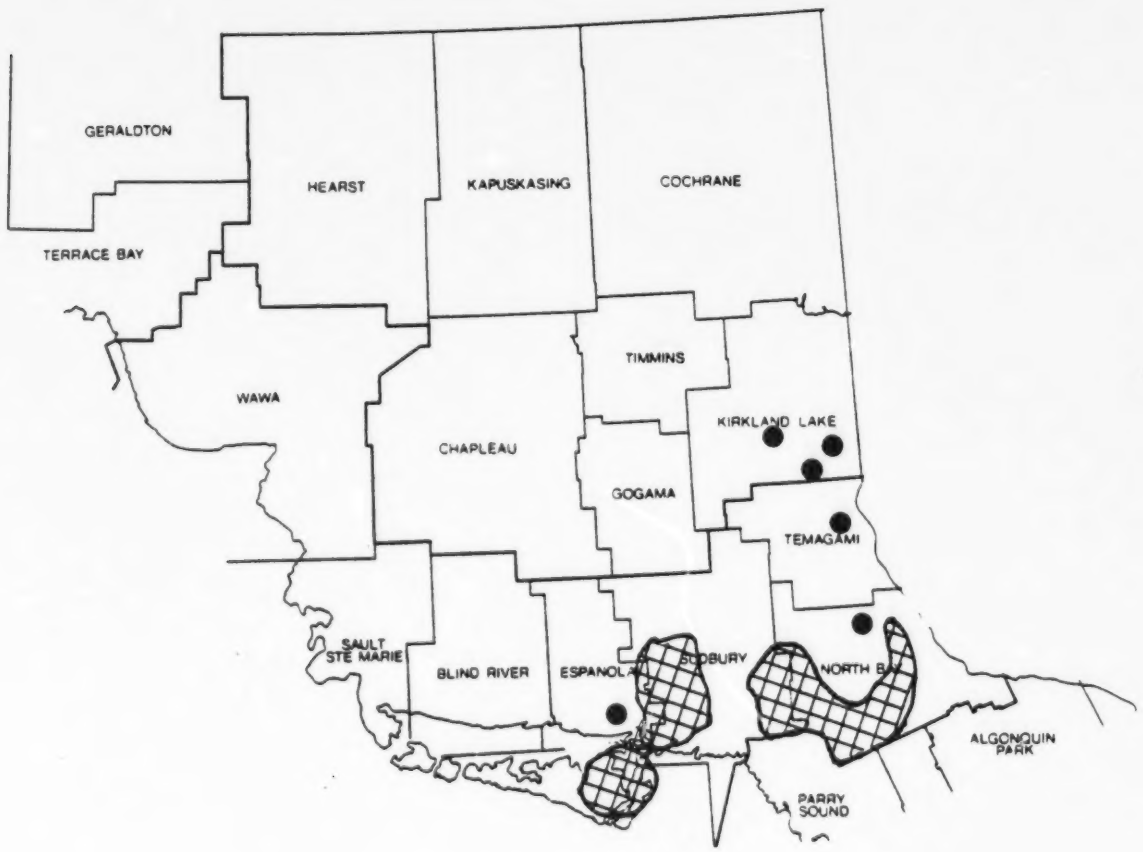
Forest Tent Caterpillar

Areas within which defoliation occurred in 1975

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO



0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1976

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1977

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Forest Tent Caterpillar

Areas within which defoliation occurred in 1978

LEGEND

Moderate-to-severe defoliation ● or

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1979

LEGEND

Moderate-to-severe defoliation ●

0 Miles 60

0 Kilometres 96

NORTHEASTERN ONTARIO

Forest Tent Caterpillar

Areas within which defoliation occurred in 1980

0 Miles 60

0 Kilometres 96

LEGEND

Moderate-to-severe defoliation

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Ambermarked Birch Leafminer

Areas with which defoliation occurred in 1958

LEGEND

Moderate-to-severe defoliation ● or ▨

NORTHEASTERN ONTARIO

0 Miles 60

0 Kilometres 96

Ambermarked Birch Leafminer

Areas within which defoliation occurred in 1960

LEGEND

Light defoliation

Moderate-to-severe defoliation